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1985 NIH ALMANAC

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Institutes of Health
NIH Publication No. 85-5
September 1985
Prepared by the Division of Public Information, Bethesda, Maryland 20205

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Foreword

Published annually, the *NIH Almanac* presents pertinent facts about the National Institutes of Health—the Federal Government's principal biomedical research agency. It is designed as a ready reference source on NIH's 11 research Institutes and 4 Divisions, the National Library of Medicine, the Clinical Center—a combined research hospital and laboratory complex—and the John E. Fogarty International Center for Advanced Study in the Health Sciences.

Publications of related interest are: *The National Institutes of Health,* NIH Publication No. 80–1, a brief general introduction to the work of NIH; *NIH Data Book,* a compilation of statistical material; and *NIH Extramural Programs,* NIH Publication No. 83–33, a compendium of the scientific programs of the NIH components that award grants and contracts. For more detailed information about these components, the reader is referred to the listing of current NIH publications and printed material contained in the *NIH Publications List,* NIH Publication No. 84–7.

The National Institutes of Health

Begun as a one-room Laboratory of Hygiene in 1887, the National Institutes of Health is today one of the world's foremost biomedical research centers. An agency of the Department of Health and Human Services, the NIH is the Federal focal point for health research.

Its mission is to uncover new knowledge that will lead to better health for everyone. NIH works toward that mission by: conducting research in its own laboratories; supporting the research of non-Federal scientists in universities, medical schools, hospitals, and research institutions throughout this country and abroad; helping in the training of research investigators; and fostering and supporting biomedical communication.

The National Institutes of Health is located on a 306.4-acre reservation in Bethesda, Md., a suburb of the District of Columbia. On these campus-like grounds, NIH maintains hundreds of laboratories containing complex and highly sophisticated research equipment, a 540-bed research hospital known as the Warren Grant Magnuson Clinical Center, and the National Library of Medicine, the world's largest repository of medical literature, and a national center for biomedical communication.

Part 1

Historical Data

Chronology of Events

(By Year)

1798—The Marine Hospital Service was established with the July 16 signing by President John Adams of an act for the relief of sick and disabled seamen.

1799—An amending act of March 2 extended benefits of the Marine Hospital Service to officers and men of the U.S. Navy.

1802—The admission of foreign seamen to Marine hospitals on a reimbursable basis was authorized on May 3.

1803—The first permanent Marine hospital was authorized on May 3 to be built in Boston, Mass.

1807—Dr. Benjamin Waterhouse was appointed physician in charge of the Boston Marine Hospital on November 27. He was the first to introduce interns and residents into hospitals in the United States.

1836—The Library of the Office of the Surgeon General of the Army was established (the present National Library of Medicine).

1865—John Shaw Billings, M.D., was assigned to supervise the Surgeon General's Library, which he built into a national resource of biomedical literature.

1870—A bill dated June 29 provided for administration of Marine hospitals within a Bureau of the Treasury Department with a medical officer in charge.

1871—Dr. John Maynard Woodworth was appointed Supervising Surgeon of the Marine Hospital Service in April, marking the beginning of central control of Marine hospitals.

1873—Regulations were approved on December 1 for appointment and promotion of physicians in the Marine Hospital Service, establishing the first career service for civilian employees in the Federal Government.

1875—A bill passed on March 3 authorized admission of Navy seamen and seamen of other government services to Marine hospitals on a reimbursable basis.

In recognition of Dr. Woodworth's progress in reorganizing the Marine Hospital Service, his title was changed by law to Supervising Surgeon General on March 3.

1878—The first Federal Quarantine Act was passed April 29.

On December 21, Congress appropriated funds "for investigating the origin and causes of epidemic diseases, especially yellow fever and cholera."

1879—The National Board of Health was created by law on March 3. It represented the first organized, comprehensive, national medical research effort of the Federal Government.

Dr. John B. Hamilton was appointed Surgeon General of the Marine Hospital Service, April 3.

1884—The seamen's hospital tax was abolished on July 1. The cost of maintaining Marine hospitals was paid out of a tonnage tax, which continued until 1906.

1887—A bacteriological laboratory, known as the Laboratory of Hygiene, was established under Dr. Joseph J. Kinyoun at the Marine Hospital, Staten Island, N.Y., in August, for research on cholera and other infectious diseases (redesignated Hygienic Laboratory in 1891.)

1889—The Commissioned Corps was authorized on January 4 establishing by law the policy of a mobile corps subject to duty anywhere upon assignment.

1890—Congress gave the Marine Hospital Service interstate quarantine authority on March 27.

1891—The Hygienic Laboratory moved from Staten Island, N.Y., to Butler Building, Service Headquarters, Washington, D.C., in June.

Dr. Walter Wyman was appointed Surgeon General of the Marine Hospital Service on June 1.

1893—A new Quarantine Act, passed February 15, strengthened the Quarantine Act of 1878 and repealed the act establishing the National Board of Health.

1899—The Marine Hospital Service was directed by Congress on March 2 to investigate leprosy in the United States.

Dr. Milton J. Rosenau succeeded Dr. Joseph J. Kinyoun as Director of the Hygienic Laboratory on May 1.

1902—The earliest studies of Rocky Mountain spotted fever took place in Montana.

A bill approved July 1 changed the name of the Marine Hospital Service to the Public Health and Marine Hospital Service and established an advisory board for the Hygienic Laboratory. It later became the National Advisory Health Council.

The 57th Congress enacted Public Law 244 to regulate the shipment of biologics. The technical responsibilities of the program were assigned to the Hygienic Laboratory.

The Advisory Board for the Biologics Control Division was established July 1.

The Pan American Sanitary Bureau was established December 2. The Public Health and Marine Hospital Service began international health cooperation.

1904—The Hygienic Laboratory moved to a new building on a 5-acre tract at 25th and E Streets N.W., Washington, D.C., on March 16.

1906—Medical care for merchant seamen and other beneficiaries of the Public Health and Marine Hospital Service began to be supported by direct congressional appropriations, with the repeal of the tonnage tax on June 30.

1909—Dr. John F. Anderson was appointed Director of the Hygienic Laboratory October 1.

1912—Dr. Rupert Blue was appointed Surgeon General of the Public Health and Marine Hospital Service on January 13.

The name Public Health and Marine Hospital Service was changed to Public Health Service (PHS) on August 14, and the research program was expanded to include other-than-communicable diseases field investigations, navigable stream pollution, and information dissemination.

1914—Dr. Joseph Goldberger announced his views of pellagra as a dietary deficiency, emphasizing the importance of dietary deficiency diseases.

1915—Dr. George W. McCoy was appointed Hygienic Laboratory Director on November 20.

1918—The Chamberlain-Kahn Act, passed July 9, provided for the study of venereal diseases. The PHS made grants to 25 institutions, establishing a precedent for the Federal Government to seek assistance of scientists through grants.

The PHS Reserve Corps was established by law on October 27, during the influenza pandemic, as a means of coping with the emergencies.

1920—Dr. Hugh Smith Cumming was appointed PHS Surgeon General on March 3.

1921—The Rocky Mountain Spotted Fever Laboratory was established in a former school building in Hamilton, Mont., on September 20 as a recognized PHS field station.

1922—The Library of the Office of the Surgeon General (Army) was renamed the Army Medical Library in January.

A Special Cancer Investigations Laboratory was established by PHS investigators at Harvard Medical School on August 1.

1929—On January 19, the Narcotics Control Act was passed, authorizing construction of two hospitals for drug addicts, and creation of a PHS Narcotics Division.

1930—On April 9, the Advisory Board for the Hygienic Laboratory became the National Advisory Health Council.

On May 26 the Ransdell Act redesignated the Hygienic Laboratory as the National Institute of Health, authorizing $750,000 for construction of two buildings for NIH, and creating a system of fellowships.

On June 14, Public Law 357 authorized creation of a separate Bureau of Narcotics in the Treasury Department and changed the PHS Narcotics Division to the Division of Mental Hygiene. The law gave the Surgeon General authority to investigate the causes, treatment, and prevention of mental and nervous diseases.

1935—A narcotic "farm" at Lexington, Ky., was completed and opened on May 29.

On August 10, Mr. and Mrs. Luke I. Wilson made a gift of 45 acres of their estate "Tree Tops" for use of the National Institute of Health in Bethesda, Md.

Title VI of the Social Security Act was passed August 14 authorizing the expenditure of up to $2 million on health grants to the states for "investigation of disease and problems of sanitation."

1936—Dr. Thomas Parran was appointed PHS Surgeon General on April 6.

1937—The Rocky Mountain Laboratory became part of the National Institute of Health in February, and was administratively made part of the Division of Infectious Diseases.

Dr. Lewis R. Thompson was appointed Director of the National Institute of Health on February 1.

With the reorganization of the National Institute of Health into eight divisions, the biologics control program, previously the responsibility of the Division of Pathology and Bacteriology, NIH, was assigned to a newly established Division of Biologics Control (redesignated Biologics Control Laboratory, 1944).

The National Cancer Institute Act was signed on July 23.

1938—The National Advisory Cancer Council recommended approval of the first awards for

fellowships in cancer research on January 3.

Mrs. Luke I. Wilson made a second gift, 10.7 acres of land, to NIH on May 28.

The cornerstone for Building 1 was laid June 30.

Congress approved construction of new, larger laboratory facilities, and NIH moved to Bethesda, Md., in July.

Mrs. Luke I. Wilson made a third gift, 14.4 acres of land, to NIH on September 30.

The narcotics hospital at Fort Worth, Tex., was dedicated on October 28.

1939—Under a Reorganization Act dated April 3, the PHS was transferred from the Treasury Department to the Federal Security Agency.

1940—Mrs. Luke I. Wilson made a fourth gift, 11.6 acres of land, to NIH on September 27.

President Franklin D. Roosevelt dedicated Building 6, the first NCI location in Bethesda, on October 31.

1942—Dr. Rolla Eugene Dyer was appointed Director of the National Institute of Health on February 1.

A final gift of land was made by Mrs. Luke I. Wilson on March 17 bringing the total to 92 acres. This was the nucleus of the present 306.4-acre reservation. Additional land was acquired through a series of purchases.

1943—NIH was given bureau status in the PHS on November 11.

1944—The Public Health Service Act was approved on July 1, consolidating and revising existing public health legislation, and giving NIH the legislative basis for its postwar program, with general authority to conduct research. Under this act NCI became a division of NIH.

1946—The Research Grants Office was created at NIH in January to administer the Office of Scientific Research and Development projects transferred to the Public Health Service at the end of World War II and to operate a program of extramural research grants and fellowship awards.

The National Mental Health Act was passed July 3.

On August 12, the Research Grants Office became the Research Grants Division (later renamed Division of Research Grants). The Division was instructed by the National Advisory Health Council to establish study sections for scientific and technical review of research grant applications, and to explore neglected areas of research in the health sciences.

The Hospital Survey and Construction Act, introduced by Senators Lister Hill and Harold H. Burton, was passed on August 13, authorizing the Hill-Burton program.

1948—Dr. Leonard A. Scheele was appointed PHS Surgeon General on April 6.

On June 16 the National Heart Act was signed. It authorized the National Heart Institute and changed the name of the National *Institute* of Health to National *Institutes* of Health.

The National Dental Research Act, passed June 24, authorized the National Institute of Dental Research.

The National Heart Institute was established August 1.

The National Institute of Dental Research was established September 16.

Construction of the Clinical Center was started in November.

The National Microbiological Institute and the Experimental Biology and Medicine Institute were established on November 1.

The Rocky Mountain Laboratory and Biologics Control Laboratory became two of the four components of the National Microbiological Institute on November 1.

1949—The purchase of 115.8 acres from the Town & Country Golf Club, Inc., for $600,000 was concluded February 11.

The purchase of 47.9 acres of land from Mr. and Mrs. G. Freeland Peter for $505,000 was concluded on February 14.

The National Institute of Mental Health was established on April 15, with the abolishment of the Division of Mental Hygiene.

The first issue of *The NIH Record* was published May 20.

The purchase of 50.2 acres of land from the Sisters of the Visitation for $173,058 was concluded on June 28.

Dr. Frank B. Rogers became Director of the Army Medical Library in October.

1950—The Omnibus Medical Research Act, signed August 15, authorized the National Institute of Neurological Diseases and Blindness and the National Institute of Arthritis and Metabolic Diseases, the latter absorbing the Experimental Biology and Medicine Institute. The act also gave the Surgeon General authority to establish new Institutes.

Dr. William H. Sebrell, Jr., was appointed NIH Director on October 1.

The National Institute of Neurological Diseases and Blindness and the National Institute of Arthritis and Metabolic Diseases were established November 22.

1951—The first R. E. Dyer Lecture was given by Dr. George W. Beadle, California Institute of Technology, June 21.

President Harry S. Truman laid the Clinical Center cornerstone on June 22.

1952—The Army Medical Library was renamed Armed Forces Medical Library in April.

1953—The first NIH Lecture was given on January 21 by Dr. Severo

Ochoa of New York University College of Medicine.

PHS became part of the newly created Department of Health, Education, and Welfare on April 11.

The Clinical Center was dedicated on July 2, extending the clinical dimension of the Public Health Service research programs.

The first patient was admitted to the Clinical Center on July 6.

1954—A central data processing facility was established in the Office of the Director, NIH.

The NIH Graduate School Program began on September 27.

1955—The biologics control function was placed in the newly formed Division of Biologics Standards in June. The Division of Research Services and Division of Business Operations were also formed.

The Cancer Chemotherapy National Service Center was established April 1 to coordinate the first national cancer chemotherapy program.

The Mental Health Study Act was passed July 28.

Dr. James A. Shannon was appointed NIH Director on August 1.

The National Microbiological Institute became the National Institute of Allergy and Infectious Diseases (NIAID) by order of the Surgeon General on December 29. The Biologics Control Laboratory was detached from the Institute and expanded to Division status within NIH.

1956—In January the biometric facility became the Biometrics Branch in the new Division of Research Services.

Dr. Leroy E. Burney was appointed PHS Surgeon General August 8.

The Armed Forces Medical Library was designated the National Library of Medicine (NLM) and placed under PHS October 1.

1957—The Center for Aging Research was established November 27 as the focal center for NIH extramural activities in gerontology.

1958—On July 16 the Division of General Medical Sciences was established by order of the Surgeon General, extending research into noncategorical areas covered until that time by the Division of Research Grants.

The Center for Aging Research was transferred from the National Heart Institute to the Division of General Medical Sciences on November 4.

1959—The Office of Administrative Management was formed July 15, consolidating the Division of Business Operations and other managerial responsibilities.

Congress appropriated $2 million for the establishment of one or two private research centers on August 19.

1960—On March 8 the Surgeon General approved establishment of a Computation and Data Processing Branch in the Division of Research Services.

NIH acquired 513 acres of farmland near Poolesville, Md., on May 6. This land became the site of the NIH Animal Center.

The International Health Research Act was passed July 12, extending NIH international programs.

1961—The Surgeon General established the Center for Research in Child Health in the Division of General Medical Sciences on February 17.

Dr. Luther L. Terry was appointed PHS Surgeon General March 24.

On May 26, DHEW Secretary Abraham A. Ribicoff dedicated the new NIDR building.

The first Jules Freund Lecture was given by Dr. Merrill W. Chase of the Rockefeller Institute on November 15.

The NIH European Office was established in Paris, France, on December 18.

1962—The NIH Latin American Office was established in Rio de Janeiro, Brazil, on July 1.

The Division of Research Facilities and Resources was established July 15.

Public Law 87-838, passed October 17, authorized the National Institute of Child Health and Human Development and the National Institute of General Medical Sciences.

Five acres of land for a Gerontology Research Center were donated by the City of Baltimore in December.

1963—The NIH Pacific Office was established in Tokyo, Japan, on January 1.

The National Institute of Child Health and Human Development and the National Institute of General Medical Sciences were established on January 30. The Center for Research in Child Health and the Center for Research in Aging (established in 1956) were transferred from NIGMS to NICHD.

The new surgical wing for the Clinical Center was dedicated September 5.

The first NIH International Lecture was given October 31 by Dr. Walsh McDermott of Cornell University Medical College.

1964—The Medical Literature Analysis and Retrieval System (MEDLARS) became operational at the NLM in January.

The Division of Computer Research and Technology was established on April 16.

On September 19 Congress authorized planning funds for a central environmental health research facility.

A special virus-leukemia program was initiated under a special appropriation, included in the FY 1965 appropriation signed into law on September 19.

1965—On January 7, the Surgeon General announced that the National Environmental Health Sciences Center would be located in Research Triangle Park, N.C.

The NIH Animal Center, Poolesville, Md., officially opened May 27 with 2 days of orientation for NIH employees, area residents and the press after completion of the first of three phases of an $18 million construction program.

NIH received a $20,250,000 supplemental appropriation on August 31 to intensify and expand support of research in heart disease, cancer, stroke and related diseases.

Dr. William H. Stewart, appointed PHS Surgeon General September 24, took office on October 2.

A reorganization of the DHEW provided for an expansion of the Secretary's office with the creation of three new assistant secretaries, including an Assistant Secretary for Health and Scientific Affairs.

Dr. Philip R. Lee was appointed to the new position of Assistant Secretary for Health and Scientific Affairs on November 2.

1966—The Division of Regional Medical Programs was created on February 1 to administer grants under the Heart Disease, Cancer and Stroke Amendments of 1965. Dr. Robert Q. Marston was appointed NIH Associate Director for Regional Medical Programs and chief of the Division.

At a White House meeting June 27, the NIH Director and the Institute Directors discussed with the President how the benefits of research findings in health could be brought more rapidly to all the people. Later in the year, a report to the President described current NIH research efforts on the major U.S. disease problems and set forth the status of those problems, the nature of present and planned investigative efforts and the problems of and opportunities for further research.

A Division of Environmental Health Sciences was established in NIH November 1 to conduct, foster and coordinate research on the biological, chemical, and physical effects of environmental agents. Dr. Paul Kotin, scientific director for etiology, NCI, was named Director of the new Division.

An advisory committee to the NIH Director was appointed on November 9 to provide advice on the further development of NIH research and related programs.

1967—The National Institute of Mental Health was separated from NIH and raised to bureau status in PHS by a reorganization that became effective January 1. NIMH's Division of Clinical, Behavorial and Biological Research, within the Mental Health Intramural Research Program, comprising activities conducted in the Clinical Center and other NIH facilities, continued here under an agreement for joint administration between the two companion bureaus.

The Toxicology Information Program was established at NLM, January 1, in response to recommendations of the President's Science Advisory Committee. The program includes the entire range of chemical effects on living organisms.

The PHS Audiovisual Facility, renamed the National Medical Audiovisual Center, became an NLM component July 1.

On September 26, the deed for 509.25 acres of Research Triangle Park, N.C., to serve as a permanent site for the Division of Environmental Health Sciences, was presented to the Surgeon General.

1968—Establishment of the John E. Fogarty International Center for Advanced Study in the Health Sciences (FIC) was given departmental approval February 26. The Center became operational on July 1, at which time the NIH Office of International Research was abolished and certain of its functions were transferred to FIC and NIAID.

Under a reorganization of health activities announced on April 1, NIH assumed status as a new operating agency within the Department, with the NIH Director reporting directly to the Assistant Secretary for Health and Scientific Affairs. Under the reorganization, the Bureau of Health Manpower and the National Library of Medicine became components of NIH.

On June 15 the four-story $7.5 million Gerontology Research Center building—located at and operated in cooperation with Baltimore City Hospitals—was officially opened.

A proposed facility to house the biomedical communications network was designated the Lister Hill National Center for Biomedical Communications by passage of P.L. 90-456 on August 3.

Established by the DHEW Secretary on August 9, the Center for Population Research conducts a contract and grant program in population and reproduction research. The Center was designated by the President as the primary Federal agency responsible for population research and training.

On August 16 the National Eye Institute (NEI) was created to build an enlarged program based on blindness research formerly conducted in the National Institute of Neurological Diseases and Blindness. The legislation also changed the NINDB name to the National Institute of Neurological Diseases.

Dr. Robert Q. Marston was sworn in as NIH Director on August 29.

A Nobel Prize in Physiology or Medicine was awarded on October 16 to Dr. Marshall W. Nirenberg,

chief of NHI's Laboratory of Biochemical Genetics, for discovering the key to deciphering the genetic code. He was the first NIH Nobel laureate, and the first Federal employee to receive a Nobel Prize.

On October 24 the President signed into law (P.L. 90–639) legislation changing the name of the NIND to the National Institute of Neurological Diseases and Stroke.

The National Eye Institute was established on December 26.

1969—A further reorganization of the NIH internal structure announced January 4 renamed the Bureau of Health Manpower as the Bureau of Health Professions Education and Manpower Training and expanded it to include seven Divisions, one of which was the Division of Research Resources (DRR).

The Division of Environmental Health Sciences was elevated to Institute status on January 12, thus becoming the 10th NIH Institute.

Dr. Roger O. Egeberg was named DHEW Assistant Secretary for Health and Scientific Affairs on July 14, succeeding Dr. Lee.

On November 10, the DHEW Secretary redesignated the National Heart Institute as the National Heart and Lung Institute (NHLI).

1970—A reorganization of the Bureau of Health Professions Education and Manpower Training renamed it the Bureau of Health Manpower Education on September 18. DRR was separated from the Bureau and became a Division within NIH.

1971—Dr. Merlin K. DuVal was appointed DHEW Assistant Secretary for Health and Scientific Affairs on July 1, succeeding Dr. Egeberg.

The White House Conference on Aging recommended creating a separate National Institute on Aging on December 2.

On December 23 the President signed the National Cancer Act of 1971 initiating a National Cancer Program, establishing the President's Cancer Panel, a National Cancer Advisory Board and 15 new research, training and demonstration cancer centers.

1972—The National Institute of Arthritis and Metabolic Diseases was renamed the National Institute of Arthritis, Metabolism, and Digestive Diseases on May 19.

On July 1, DBS transferred from NIH and officially became a sixth bureau—Bureau of Biologics—in the Food and Drug Administration. The Bureau continues to use NIH facilities and buildings.

The DHEW Secretary approved a reorganization of NHLI on July 14, elevating the Institute to Bureau status within NIH.

A Bureau-level organization was established for the National Cancer Institute on July 27.

On October 25 Public Law 92–564 established a temporary National Commission on Multiple Sclerosis (supported by NINDS).

Dr. Christian B. Anfinsen, NIAMDD, won the Nobel Prize in Chemistry for his work on ribonuclease.

1973—Dr. Charles C. Edwards was appointed DHEW Assistant Secretary for Health on April 18, succeeding Dr. DuVal.

Dr. Robert S. Stone was sworn in as 10th NIH Director on May 29.

The Bureau of Health Manpower Education was transferred from NIH to the new Health Resources Administration on July 1 and renamed the Bureau of Health Resources Development.

The National Institute of Mental Health rejoined the National Institutes of Health on July 1. On September 25, NIMH became part of the new Alcohol, Drug Abuse and Mental Health Administration.

1974—The Research on Aging Act of 1974, creating the National Institute on Aging (NIA), was signed into law on May 31.

On July 23, the National Cancer Act Amendments of 1974 was signed by the President to improve the National Cancer Program. It also established a President's Biomedical Research Panel.

The National Institute on Aging was established on October 7.

The Interagency Primate Steering Committee was established by the DHEW Assistant Secretary for Health with NIH as the lead agency.

Institutional Relations Branch was transferred on October 27 from DRG to the immediate Office of the Director, NIH, and renamed the Office for Protection From Research Risks.

1975—On March 13 the National Institute of Neurological Diseases and Stroke was renamed the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS).

Dr. Theodore Cooper was appointed DHEW Assistant Secretary for Health on July 1, succeeding Dr. Edwards.

Dr. Donald S. Fredrickson was sworn in as the 11th NIH Director on July 1.

The Adult Development and Aging Branch and the Gerontology Research Center were separated from NICHD to become the core on the National Institute on Aging also on July 1.

1976—On June 25, the National Heart and Lung Institute was renamed the National Heart, Lung, and Blood Institute (NHLBI).

Dr. D. Carleton Gajdusek, NINCDS, shared the Nobel Prize in Physiology or Medicine with Dr. Baruch Blumberg, Institute for Cancer Research. Dr. Gajdusek was honored for his research on kuru and Dr. Blumberg for his work on the Australia antigen at the National Institute of Arthritis

and Metabolic Diseases (1957–1964).

1977—Construction of the Ambulatory Care Research Facility was started in April.

On July 13, Dr. Julius B. Richmond took the oath of office as DHEW Assistant Secretary for Health and Surgeon General, becoming the first person to hold both offices simultaneously.

1978—On November 15 the DHEW Secretary announced the establishment of the National Toxicology Program under direction of NIEHS.

1979—Dr. Hans J. Muller Eberhard, Scripps Clinic and Research Foundation, delivered the first Kinyoun Lecture on April 24.

A protocol of cooperation in the exchange of information on medicine and public health between the United States and China was signed on June 22 in Beijing's historic Great Hall. The DHEW Secretary signed on behalf of the U.S.

On July 18 NCI and the National Naval Medical Center, Bethesda, Md., agreed to cooperate in a cancer treatment research program.

1980—DHEW became the Department of Health and Human Services (DHHS) on May 14. A separate Department of Education was established.

On May 22, the Lister Hill Center for Biomedical Communications was dedicated as part of NLM.

1981—On May 14 Dr. Edward N. Brandt, Jr., was sworn in as Assistant Secretary for Health.

The National Institute of Arthritis, Metabolic, and Digestive Diseases was renamed the National Institute of Arthritis, Diabetes, and Digestive and Kidney diseases (NIADDK) on June 23.

On June 30 Dr. Fredrickson stepped down as NIH Director. Dr. Thomas E. Malone was appointed Acting Director.

The Ambulatory Care Research Facility was officially dedicated on October 22. The research hospital was renamed the Warren Grant Magnuson Clinical Center in honor of the former chairman of the Senate Committee on Appropriations. Sen. Magnuson was involved in support of biomedical research at NIH since 1937.

Dr. C. Everett Koop became PHS Surgeon General on November 16.

1982—On April 22 NIADDK was converted to bureau status, joining NCI, NHLBI, and NLM. Dr. James B. Wyngaarden, chairman of the Duke University department of medicine, was appointed NIH Director on April 29.

The National Institute of Child Health and Human Development marked its 20th anniversary on September 20.

NIGMS celebrated its 20th anniversary by establishing the DeWitt Stetten, Jr., Lectureship. Dr. David S. Hogness, Stanford University, gave the first lecture on October 13.

The National Institute on Aging opened its first on-campus research unit in the NIH Clinical Center.

The NIEHS facility in Research Triangle Park, N.C., was dedicated on November 15.

Lasker Foundation Awards were presented on November 17 to three NIH scientists: Dr. Elizabeth Neufeld, NIADDK; Dr. Roscoe O. Brady, NINCDS; and Dr. Robert C. Gallo, NCI.

1983—On January 18, Bldg. 1 was officially named the James A. Shannon Bldg. in honor of the former NIH Director (1955–1968).

The first multidisciplinary pain clinic in the U.S. devoted exclusively to research was opened in the Clinical Center March 21 by NIDR.

NCI dedicated its R.A. Bloch International Cancer Information Center on October 2. The building houses the Institute's information programs that serve health professionals and scientists.

In December, the Clinical Center celebrated its 30th anniversary of operation.

Legislative Chronology

This legislative chronology is limited to enactments that had a major influence upon the Marine Hospital Service as it evolved into the Public Health Service, to legislation leading to the establishment of the National Institutes of Health, and to specific NIH legislation with the exception of appropriations bills.

July 16, 1798—"An Act for the relief of sick and disabled Seamen" established the Marine Hospital Service for merchant seamen. The Marine Hospital Service—forerunner of the present-day PHS—became a component of the Treasury Department. A monthly hospital tax of 20 cents was deducted from the pay of merchant seamen in the first prepaid medical care plan in the United States. (1 Stat. L. 605.)

March 2, 1799—An amending act to the legislation of 1798 extended Marine Hospital Service benefits to officers and men of the U.S. Navy. This arrangement continued until 1818 after which the Navy built its own hospitals. However, the deduction of 20 cents per month from the pay of Navy and Marine Corps personnel continued until June 15, 1943. (1 Stat. L. 729.)

June 29, 1870—A bill to reorganize the Marine Hospital Service and establish a central controlling office in Washington, D.C., was enacted. This act also increased the amount of hospital tax paid by seamen from 20 cents to 40 cents per month, a tax which continued until 1884. (16 Stat. L. 169.) (After the seamen's hospital

tax was abolished July 1, 1884, the cost of maintaining Marine hospitals was paid out of a tonnage tax until 1906. Since then medical care for merchant seamen and other beneficiaries of the service has been supported by direct congressional appropriations.)

March 3, 1875—An act was passed authorizing the admission of seamen from the Navy and other government services to Marine hospitals on a reimbursable basis.

The Surgeon General of the Marine Hospital Service was to be appointed by the President, by and with the advice and consent of the Senate. (18 Stat. L. 377.)

April 29, 1878—The first Federal Quarantine Act "to prevent the introduction of contagious or infectious diseases into the United States" was passed. (20 Stat. L. 37.)

March 3, 1879—The National Board of Health was created by law and given quarantine powers; first organized, comprehensive Federal medical research effort. (20 Stat. L. 484.)

January 4, 1889—A bill to establish a commissioned officer corps in the Marine Hospital Service was passed. This law established a mobile corps subject to duty anywhere upon assignment, a policy that had been in effect since Dr. Woodworth assumed leadership of the Marine Hospital Service in 1871. (25 Stat. L. 639.)

March 27, 1890—Congress gave the Marine Hospital Service interstate quarantine authority. (26 Stat. L. 31.)

February 15, 1893—A new Quarantine Act was passed following outbreaks of cholera in Europe, strengthening the inadequate Quarantine Act of 1878 by giving the Federal Government the right of quarantine inspection. The act of March 3, 1879, was repealed. (27 Stat. L. 449.)

March 2, 1899—The Marine Hospital Service was directed by Congress to investigate leprosy in the United States. (30 Stat. L. 976.)

March 3, 1901—An appropriation of $35,000 was made for the Hygenic Laboratory building (first legislative mention of Hygenic Laboratory). Thus "investigations of contagious and infectious diseases and matters pertaining to public health" were given definite status in law. (31 Stat. L. 1086.)

July 1, 1902—A bill to increase the efficiency and change the name of the Marine Hospital Service to Public Health and Marine Hospital Service was enacted. The law authorized the establishment of specified administrative divisions and, for the first time, designated a bureau of the Federal Government as an agency in which public health matters could be coordinated. (32 Stat. L. 712.)

Another law, usually referred to as the Biologics Control Act, authorized the Public Health and Marine Hospital Service to regulate the transportation or sale for human use of viruses, serums, vaccines, antitoxins, and analogous products in interstate traffic or from any foreign country into the United States. (P.L. 57-244, 32 Stat. L. 728.)

August 14, 1912—Under an act, the name Public Health and Marine Hospital Service was changed to Public Health Service. The legislation broadened the PHS research program to include "diseases of man" and contributing factors such as pollution of navigable streams, and information dissemination. (37 Stat. L. 309.)

July 9, 1918—The Chamberlain-Kahn Act provided for the study of venereal diseases by the PHS. (40 Stat. L. 886.)

October 27, 1918—A PHS reserve corps was established. The 1918 influenza pandemic emphasized the need for a reserve corps to meet such emergency situations. (40 Stat. L. 1017.)

January 19, 1929—The Narcotics Control Act provided for construction of two hospitals for the care and treatment of drug addicts, and authorized creation of a Narcotics Division in the PHS Office of the Surgeon General. (P.L. 70-672, 45 Stat. L. 1085.)

April 9, 1930—A law changed the name of the Advisory Board for the Hygienic Laboratory to the National Advisory Health Council. (P.L. 71-106, 46 Stat. L. 152.)

May 26, 1930—The Ransdell Act reorganized, expanded, and redesignated the Hygienic Laboratory as the National Institute of Health. The act authorized $750,000 for the construction of two buildings for NIH and authorized a system of fellowships. (P.L. 71-251, 46 Stat. L. 379.)

June 14, 1930—A law authorized creation of a separate Bureau of Narcotics in the Treasury Department to control trading in narcotic drugs and their use for therapeutic purposes. Also, the legislation redesignated the PHS Narcotics Division to the Division of Mental Hygiene, giving the Surgeon General authority to investigate abuse of narcotics and the causes, treatment, and prevention of mental and nervous diseases. (P.L. 71-357, 46 Stat. L. 585.)

August 14, 1935—The Social Security Act was an event of major importance in the progress of public health in the United States. This act authorized health grants to the states on the principle that the most effective way to prevent the interstate spread of disease is to improve state and local public health programs. With this legislation, the PHS became adviser and practical assistant to state and local health services. (P.L. 74-271, 49 Stat. L. 634.)

August 5, 1937—A law established the National Cancer Institute to conduct and support research relating to the cause, diagnosis, and treatment of cancer. The law authorized the Surgeon General to make grants-in-aid for research in the field of cancer, provide fellowships, train personnel, and assist the states in their efforts toward cancer prevention and control. (P.L. 75–244, 50 Stat. L. 559.)

April 3, 1939—The Reorganization Act of 1939 transferred the PHS from the Treasury Department to the Federal Security Agency. (P.L. 76–19, 53 Stat. L. 561.)

July 1, 1944—The Public Health Service Act consolidated and revised laws pertaining to the PHS and divided the service into the Office of the Surgeon General, Bureau of Medical Services, Bureau of State Services, and the National Institute of Health. The act gave the Surgeon General broad powers to conduct and support research into the diseases and disabilities of man, authorized projects and fellowships, and made the National Cancer Institute a division of NIH. The act also empowered the Surgeon General to treat at PHS medical facilities, for purposes of study, persons not otherwise eligible for such treatment. (P.L. 78–410, 58 Stat. L. 682.) Under this provision, the Clinical Center was later established. (Under this act, the Research Grants Office, January 1, 1946; the Experimental Biology and Medicine Institute and the National Microbiological Institute, November 1, 1948; and the Division of Research Services, January 1, 1956, were established.)

July 3, 1946—The National Mental Health Act was designed to improve the mental health of U.S. citizens through research into the causes, diagnosis, and treatment of psychiatric disorders. It authorized the Surgeon General to support research, training, and assistance to state mental health programs. (P.L. 79–487, 60 Stat. L. 421.) (The National Institute of Mental Health was established under the authority of this law on April 15, 1949.)

August 13, 1946—The Hospital Survey and Construction Act (Hill-Burton Act) authorized grants to the states for construction of hospitals and public health centers, for planning construction of additional facilities, and for surveying existing hospitals and other facilities. (P.L. 79–725, 60 Stat. L. 1040.)

July 8, 1947—Under P.L. 80–165, research construction provisions of the Appropriations Act for FY 1948 provided funds "for the acquisition of a site, and the preparation of plans, specifications, and drawings, for additional research buildings and a 600-bed clinical research hospital and necessary accessory buildings related thereto to be used in general medical research. . . ."

June 16, 1948—The National Heart Act authorized the National Heart Institute to conduct, assist, and foster research; provide training; and assist the states in the prevention, diagnosis, and treatment of heart diseases. In addition, the act changed the name of National *Institute* of Health to National *Institutes* of Health. (P.L. 80–655, 62 Stat. L. 464.)

June 24, 1948—The National Dental Research Act authorized the National Institute of Dental Research to conduct, assist, and foster dental research; provide training; and cooperate with the states in the prevention and control of dental diseases. (P.L. 80–755, 62 Stat. L. 598.)

August 15, 1950—The Omnibus Medical Research Act authorized the Surgeon General to establish the National Institute of Neurological Diseases and Blindness, as well as additional Institutes, to conduct and support research and research training relating to other diseases and groups of diseases. (P.L. 81–692, 64 Stat. L. 443.) (The National Institute of Arthritis and Metabolic Diseases and the National Institute of Neurological Diseases and Blindness were established under the authority of this act on November 22, 1950. Under this same act, the National Institute of Allergy and Infectious Diseases was established on December 29, 1955, replacing the National Microbiological Institute which was originally established November 1, 1948, under authority of section 202 of the Public Health Service Act.)

April 1, 1953—Reorganization plan #1 assigned the PHS to the new Department of Health, Education, and Welfare.

July 28, 1955—The Mental Health Study Act authorized the Surgeon General to award grants to nongovernmental organizations for partial support of a nationwide study and reevaluation of the problems of mental illness. Under this act, the Joint Committee on Mental Illness and Health was awarded grant support for 3 years. (P.L. 84–182, 69 Stat. L. 381.)

July 3, 1956—The National Health Survey Act authorized the Surgeon General to survey sickness and disabilities in the United States on a sampling basis. (P.L. 84–652, 70 Stat. L. 489.)

July 28, 1956—The Alaska Mental Health Enabling Act provided for territorial treatment facilities to eliminate the need to transport the mentally ill outside Alaska. It also authorized PHS grants to Alaska for its mental health program. (P.L. 84–830, 70 Stat. L. 709.)

July 30, 1956—The Health Research Facilities Act of 1956 (Title VII of the PHS act) authorized a PHS program of Federal matching grants to public and nonprofit institutions for the

construction of health research facilities. (P.L. 84–835, 70 Stat. L. 717.)

August 2, 1956—The Health Amendments Act of 1956 authorized the Surgeon General to assist in increasing the number of adequately trained nurses and professional public health personnel. It also authorized PHS grants to support the development of improved methods of care and treatment of the mentally ill. (P.L. 84–911, 70 Stat. L. 923.)

August 3, 1956—An amendment to Title III of the Public Health Service Act, the National Library of Medicine Act, placed the Armed Forces Medical Library under the PHS, and renamed it the National Library of Medicine. (P.L. 84–941.)

June 30, 1958—The Mutual Security Act of 1958 amended P.L. 83–480, authorizing the President to enter into agreements with friendly nations to use foreign currencies accruing under title I for collection, translation, and dissemination of scientific information and to conduct research and support scientific activities overseas. (P.L. 85–477.)

July 12, 1960—Congress passed the International Health Research Act. The law authorized the Surgeon General to establish and make grants for fellowships in the United States and participating foreign countries; make grants or loans of equipment and other materials to participating foreign countries for use by public or nonprofit institutions and agencies; participate in international health meetings, conferences, and other activities; and facilitate the interchange of research scientists and experts between the United States and participating foreign countries. (P.L. 86–610, 74 Stat. L. 364.)

September 15, 1960—A law amended the Public Health Service Act to authorize grants-in-aid to universities, hospitals, laboratories, and other public and nonprofit institutions to strengthen their programs of research and research training in the sciences related to health. The act also authorized the use of funds appropriated for research or research training to be set aside by the Surgeon General in a special account for general research support grants. (P.L. 86–798, 74 Stat. L. 1053.)

October 17, 1962—An act authorized the Surgeon General to establish the National Institute of General Medical Sciences and the National Institute of Child Health and Human Development. The latter was authorized to conduct and support research and training relating to maternal health; child health; human development, in particular the special health problems of mothers and children; and the basic sciences relating to the processes of human growth and development. The former was authorized to conduct and support research in the basic medical sciences and related behavioral sciences that have significance for two or more Institutes, or which are outside the general area of responsibility of any other Institute. (P.L. 87–838, 76 Stat. L. 1072.) (On January 30, 1963, the NICHD and the NIGMS were established under this act.)

September 24, 1963—A law amended the Health Research Facilities Act of 1956 (Title VII to the Public Health Service Act) to allow grants for multipurpose facilities that would provide teaching space as well as essential research space. (P.L. 88–129, 77 Stat. L. 164.)

October 24, 1963—The Maternal and Child Health and Mental Retardation Planning Amendments of 1963 amended the Social Security Act of 1935 by authorizing a five-point grant program of $265 million, over a 5-year period. Major provisions designed to prevent mental retardation included increased Federal grants for maternal and child health services and crippled children's service administered by the Children's Bureau; a new 5-year program of grants to the states for health care of expectant mothers who have, or are likely to have, conditions associated with childbearing which may lead to mental retardation; funds for research to improve maternal and child health and crippled children's services; and grants to the states to assist in developing plans for comprehensive state and community programs to combat mental retardation. (P.L. 88–156, 77 Stat. L. 273.)

October 31, 1963—A companion measure to Public Law 88–156 was the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963. This act authorized a total of $329 million over 5 years for grants to assist in the construction of mental retardation research centers and community mental health centers, and to train teachers of mentally retarded and other handicapped children. (P.L. 88–164, 77 Stat. L. 282.)

August 18, 1964—The Hospital and Medical Facilities Amendments of 1964 extended the Hospital Survey and Construction Act of 1946 (Hill-Burton Act) for 5 years with a total authorization of $1.4 billion. (P.L. 88–443, 78 Stat. L. 447.)

August 27, 1964—The Graduate Public Health Training Amendments of 1964 extended the authorization for public health traineeships and training grants to schools of public health, nursing, and engineering for 5 years, through June 30, 1969. (P.L. 88–497, 78 Stat. L. 613.)

September 19, 1964—The Appropriations Act for 1965 included $10 million for establishment of a virus-leukemia program. (P.L. 88–605.)

August 4, 1965—The Mental Retardation Facilities and Community Mental Health Centers Construction Act Amendments of 1965 provided monies through FY 1972 to help finance initial staffing of community mental health centers which were authorized in the original act; extended and increased appropriations authority for mental retardation education research and demonstration projects; and authorized increased annual funds through FY 1969 for training teachers of the handicapped young. (P.L. 89-105.)

August 9, 1965—The Health Research Facilities Amendments of 1965 extended the program for construction of health research facilities for 3 years with $280 million authorized for that period in lieu of the previous $50 million annual appropriations authorizations. (P.L. 89-115.)

August 31, 1965—A supplemental appropriations act resulting from recommendations of the President's Commission on Heart Disease, Cancer and Stroke provided an additional $20,250,000 (shared by NCI, NHI, NIGMS and NINDB) to intensify and expand support of research in the three major "killer" diseases. (P.L. 89-156.)

October 6, 1965—The Heart Disease, Cancer and Stroke Amendments of 1965 provided for establishment of regional cooperative programs in research, training, continuing education and demonstration activities in patient care among medical schools, clinical research institutions and hospitals so that the latest treatment methods for the three diseases may be more widely available to patients. Under this act, the Division of Regional Medical Programs was created February 1, 1966. (P.L. 89-239.)

October 22, 1965—The Medical Library Assistance Act was passed, authorizing NLM's extramural programs. (P.L. 89-291.)

August 3, 1968—A law authorized the designation of a national center for biomedical communications as the Lister Hill National Center for Biomedical Communications. (P.L. 90-456.)

August 16, 1968—An amendment to the Public Health Service Act authorized the Secretary to establish a National Eye Institute and to rename NINDB the National Institute of Neurological Diseases. The new Institute was formed from NINDB programs to conduct and support research for new treatment and cures, and training relating to blinding eye diseases and visual disorders. (P.L. 90-489.)

The Health Manpower Act of 1968 extended and expanded the following five health laws then in effect: Health Professions Educational Assistance Act of 1963, as amended; Nurse Training Act of 1964, as amended; Allied Health Professions Personnel Training Act of 1966; Health Research Facilities Act of 1956, as amended; and Public Health Service Act of 1944, as amended. The measure provided a 2-year extension, through FY 1971, of the above legislation except for the Allied Health Professions Act, extended only through FY 1970. (P.L. 90-490.)

October 24, 1968—The President signed legislation further amending the name of NIND to National Institute of Neurological Diseases and Stroke. (P.L. 90-639.)

March 12, 1970—An amendment to the PHS act extended and made coterminous through June 30, 1973, the authority to make formula grants to schools of public health, project grants for graduate training in public health, and traineeships for professional public health personnel. (P.L. 91-208, 84 Stat. 52.)

March 13, 1970—The Medical Library Assistance Extension Act of 1970 amended the Public Health Service Act to improve and extend the provisions relating to assistance to medical libraries and related instrumentalities for 3 years through June 30, 1973. (P.L. 91-212, 84 Stat. 63.)

October 30, 1970—The PHS act was amended to provide: 1) Extension of research contract authority in areas of public health through June 30, 1974; 2) Authorization of mission-related clinical training (as well as research training) by the NIGMS; 3) Clarification of terms in the regulation of biological products; 4) Clarifying and technical directives relating to appointment, compensation and functions of advisory councils and committees, and 5) Extension of statutory authority for regional medical programs, comprehensive medical planning, and health services research and development. (P.L. 91-515.)

November 2, 1970—The Health Training Improvement Act of 1970 extended and amended allied health professions training authority (which expired June 30, 1970) and established eligibility of new health professions educational assistance schools for "start-up" grants. (P.L. 91-519.)

December 24, 1970—The Congress enacted the Family Planning Services and Population Research Act of 1970 to expand, improve and better coordinate family planning services and population research activities of the Federal Government. (P.L. 91-572.)

May 22, 1971—Congress passed into law the Supplemental Appropriations Bill, which included $100 million for cancer research. This appropriation was made in response to the President's State of the Union address, in which he called for "an intensive campaign to find a cure for

cancer." The appropriation includes authority under grants and contracts, as well as direct construction authority for NCI. (P.L. 92-18.)

July 9, 1971—A law amended the Public Health Service Act to provide for extension of student loan scholarship programs for up to four fiscal years. (P.L. 92-52.)

November 18, 1971—The President signed the Comprehensive Health Manpower Training Act of 1971 to provide increased manpower in the health professions, and the Nurse Training Act of 1971 to provide training for increased numbers of nurses. (P.L. 92-157, P.L. 92-158.)

December 23, 1971—The National Cancer Act of 1971 enlarged the authorities of NCI and NIH in order to advance the national effort against cancer. The authority of the Director, NCI, was expanded, a National Cancer Advisory Board was established, and appropriations in excess of $400 million were authorized for 1972, with further increases in subsequent years. (P.L. 92-218.)

May 16, 1972—The National Sickle Cell Anemia Control Act of 1972 became law and established a national program for diagnosis and treatment of, and counseling and research in, sickle cell disease. (P.L. 92-294.)

May 19, 1972—The need for further support of research and training in the field of digestive diseases was emphasized by adding a new Section 434 to the PHS act and renaming NIAMD the National Institute of Arthritis, Metabolism, and Digestive Diseases. (P.L. 92-305.)

August 29, 1972—The National Cooley's Anemia Control Act authorized over $9 million for 3 years for research in the diagnosis and treatment of Cooley's anemia, and for counseling and public information programs. (P.L. 92-414.)

September 19, 1972—The National Heart, Blood Vessel, Lung, and Blood Act expanded the authorities of the National Heart and Lung Institute to augment the national effort against heart, lung, and blood diseases. Appropriations of $375 million for 1973 were authorized with further increases in subsequent years. (P.L. 92-423.)

October 25, 1972—The National Advisory Commission on Multiple Sclerosis Act established a commission charged to determine the most productive avenue of researching possible causes and cures of MS, and make specific recommendations for the maximum utilization of national resources directed toward MS. (P.L. 92-563.)

June 18, 1973—The Health Programs Extension Act of 1973 extended the medical library assistance programs of NLM (with the exception of the construction program) for 1 year. Population research and family planning activities were also extended through FY 1974, along with other Federal health programs. (P.L. 93-45.)

November 16, 1973—The Emergency Medical Services System Act of 1973 amended the Public Health Service Act to provide assistance and encouragement for the development of comprehensive area emergency medical services systems, including grants and contracts for the support of research in emergency medical techniques, methods, devices, and delivery. (P.L. 93-154.)

April 22, 1974—The Sudden Infant Death Syndrome Act of 1974 amended the Public Health Service Act to authorize specific and general research on the sudden infant death syndrome through the NICHD. The collection, analysis, and public dissemination of information and data and the support of counseling programs were also authorized. The act did not authorize specific funds for research, but did authorize appropriations of $9 million over a 3-year period for the other programs. (P.L. 93-270.)

May 31, 1974—The Research on Aging Act of 1974 established a National Institute on Aging. The act authorized the NIA to conduct and support biomedical, social, and behavioral research and training related to the aging process and the diseases and other special problems and needs of the aged. (P.L. 93-296.)

June 22, 1974—The Energy Supply and Coordination Act directed the Secretary through NIEHS to study the effects of chronic exposure to sulfur oxides, and authorized $3.5 million for that purpose. (P.L. 93-319.)

July 12, 1974—The National Research Act of 1974 amended the Public Health Service Act by repealing existing research training and fellowship authorities and consolidating such authorities in the national research service awards authority. The NRSA's (both individual and institutional grants) are restricted on the basis of subject area shortages and would involve service obligations and payback provisions. The act established a temporary National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research within the Department to make a comprehensive investigation of the ethical principles involved in biomedical and behavioral research (including psychosurgery and living fetus research), and to develop ethical guidelines for conducting such research. Also, a permanent National Advisory Council for the Protection of Subjects of Biomedical and Behavioral Research was to be established. (P.L. 93-348.)

July 23, 1974—The National Cancer Act Amendments of 1974

authorized $2.565 billion over a 3-year period to extend and improve the National Cancer Program as well as $210.5 million over 3 years for cancer control programs. The act also: 1) established the President's Biomedical Research Panel to make a comprehensive investigation of Federal biomedical and behavioral research; 2) extended indefinitely the research contract authority of Section 301(h) of the PHS act; 3) provided that the Director, NIH, shall be appointed by the President by and with the advice of the Senate, and 4) required peer review of NIH and ADAMHA grant applications and contract projects. (P.L. 93-352.)

The Health Services Research, Health Statistics, and Medical Libraries Act of 1974 extended and amended NLM program authorities ($37.5 million over a 2-year period). The act also extended the FIC's authority to engage in international cooperative efforts in health. (P.L. 93-353.)

The National Diabetes Mellitus Research and Education Act provided for regional research and training centers ($40 million authorized over a 3-year period), a long-range plan prepared by a National Commission on Diabetes, expanded research and training programs, a Diabetes Mellitus Coordinating Committee, and an associate director for diabetes in the National Institute of Arthritis, Metabolism, and Digestive Diseases. (P.L. 93-354.)

October 29, 1974—The Federal Fire Prevention and Control Act authorized $5 million and $8 million for fiscal years 1975-76 for establishment of 25 research and treatment centers, 25 burn units, and 90 burn programs by NIH. (P.L. 93-498.)

January 4, 1975—The National Arthritis Act established a National Commission on Arthritis and Related Musculoskeletal Diseases, authorized $2 million to develop a long-range plan involving research, training, services and data systems; established an associate director for arthritis in NIAMDD; and provided 3-year authorizations for arthritis screening, detection, prevention, and referral projects and for arthritis research and demonstration centers. (P.L. 93-640.)

July 29, 1975—A law extended and amended authorities of Title X relating to family planning and population research and made Title X sole authority for all departmental extramural, collaborative, and intramural research in "biomedical, contraceptive development, behavioral, and program implementation fields related to family planning and population;" and created two temporary national commissions for the control of epilepsy and Huntington's disease. (P.L. 94-63.)

April 22, 1976—The Health Research and Health Services Amendments 1) extended authorization through FY 1977 and amended provisions governing the programs of the National Heart and Lung Institute, placed increased emphasis on blood-related research, and changed the Institute's name to the National Heart, Lung, and Blood Institute; 2) mandated studies by the President's Biomedical Research Panel and the National Commission for the Protection of Human Subjects of the implications of public disclosure of information contained in grant applications and contract proposals; 3) authorized broad-based genetic diseases research under Section 301 of the Public Health Service Act, and provided for programs of counseling, testing, and information dissemination about genetically transmitted diseases; and 4) extended authorization through FY 1977 for national research service awards for NIH and ADAMHA. The act prohibited consideration of political affiliation in making appointments to health advisory committees. (P.L. 94-278.)

October 19, 1976—The 1976 Arthritis, Diabetes, and Digestive Diseases Amendments 1) provided for an arthritis data system; 2) emphasized public information and encouragement of proper treatment for arthritis; 3) established a National Arthritis Advisory Board; 4) provided for a National Diabetes Board; and 5) established a National Commission on Digestive Diseases to develop a long-range plan for research. (P.L. 94-562.)

October 21, 1976—The Emergency Medical Services Amendments of 1976 extended the National Commission on Arthritis; extended the Commission for the Protection of Human Subjects of Biomedical and Behavioral Research; and authorized research and demonstration programs on burn injuries under Title XII of the PHS act. (P.L. 94-573.)

August 1, 1977—Health Planning and Health Services Research and Statistics Extension, Biomedical Research Extension, and Health Services Extension Acts of 1977 continued the following programs through September 30, 1978: the Medical Library Assistance Program; cancer research and control programs; heart, blood vessel, lung and blood disease research, prevention and control programs; national research service awards; population research and voluntary family planning programs; and sudden infant death syndrome information and counseling programs. It also extended various health service programs. (P.L. 95-83.)

August 7, 1977—The Clean Air Act Amendments established a coordinating committee to review

and comment on plans, execution, and results of research relating to the stratosphere. NCI and NIEHS are members. It also established a Task Force on Environmental Cancer and Heart and Lung Disease, with NCI, NHLBI, and NIEHS among the members. (P.L. 95-95.)

September 29, 1977—The Food and Agriculture Act of 1977 designated the Department of Agriculture as the lead agency of the Federal Government for agricultural research (except with respect to the biomedical aspects of human nutrition concerned with diagnosis or treatment of disease). The act also required establishment of procedures for coordinating nutrition research in areas of mutual interest between DHEW and Department of Agriculture. (P.L. 95-113.)

November 9, 1977—The Federal Mine Safety and Health Amendments of 1977 gave the Secretary, HEW, authority to appoint an advisory committee on coal or other mine health research. One member of this committee is to be the Director of the NIH, or his delegate, with consent of the Director. (P.L. 95-164.)

November 23, 1977—The Saccharin Study and Labeling Act extended the Commission for the Protection of Human Subjects until November 1, 1978. (P.L. 95-203.)

November 9, 1978—The Family Planning, Population Research and SIDS Amendments authorized a 3-year extension for the aforementioned programs through FY 1981. This was the only authority for population research programs in NICHD, the Center for Population Research. (P.L. 95-613.)

Amendments to the Community Mental Health Centers Act authorized a 3-year extension for NLM programs, and NRSA's expiring September 30, 1981, and a 2-year extension for each of the following: Community Mental Health Centers, NHLBI, and NCI. This legislation also authorized the Secretary, HEW, to: 1) conduct studies and tests of substances for carcinogenicity, teratogenicity, mutagenicity and other harmful biological effects; 2) establish and conduct a comprehensive research program on the biological effects of low-level radiation; 3) conduct and support research and studies on human nutrition; and 4) publish an annual report which lists all substances known to be carcinogenic and to which a significant number of Americans are exposed. (P.L. 95-622.)

Other important provisions of this act included the authority given to the Director of NIH to appoint 200 experts and consultants for the use of NIH components other than NCI and NHLBI and the establishment of the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research.

The Health Services Research, Health Statistics, and Health Care Technology Act of 1978 (P.L. 95-623) established in the Office of the Assistant Secretary for Health, the National Center for Health Care Technology, and reauthorized for 3 years the National Center for Health Statistics and the National Center for Health Services Research.

The legislation also established the National Council on Health Care Technology on which the Director, NIH, serves as an ex officio member. The Director, NIH, is required annually to submit to the center a listing of all technologies under development which appear likely to be used in the practice of medicine.

NLM is required to disseminate, publish, and make available all standards, norms, and criteria developed by the council concerning the use of particular health care technologies. (P.L. 95-623.)

October 17, 1979—The Department of Education Organization Act established a new Department of Education and renamed the DHEW the Department of Health and Human Services. (P.L. 96-88.)

December 12, 1979—The Emergency Medical Services Systems Amendments and Sudden Infant Death Syndrome Amendments of 1979 required the NICHD to assure that "adequate amounts" of its appropriated dollars are used for research into identification of infants at risk of SIDS and for prevention of SIDS. In addition, the NICHD is required to provide information on expenditure of funds for these purposes, the number of SIDS grant applications received and approved, the latest research findings on SIDS, and estimate of needs for funds in succeeding years. (P.L. 96-142.)

December 29, 1979—Public Law 96-167 extended the tax exemption for NRSA's for 1 year.

Public Law 96-171 required that the NIH Director, in consultation with the Secretary of Transportation, conduct a study to determine the effect of aging on the ability of individuals to perform the duties of pilots. The report on the study was to be submitted to Congress within 1 year after enactment.

September 26, 1980—P.L. 96-359 requires the HHS Secretary to conduct a study to determine the long-term effects of hypochloremic metabolic alkylosis resulting from chloride-deficient formulas. The responsibility for the study was assigned to NICHD.

December 12, 1980—P.L. 96-517 revised the patent and trademark laws and in particular awarded title to the patent rights for inventions made with Federal assistance to nonprofit

organizations and small businesses.

The Clinical Center was redesignated as the Warren Grant Magnuson Clinical Center of NIH. (P.L. 96-518.)

December 17, 1980—P.L. 96-538 reauthorized for 2 years programs for NHLBI and NCI; changed the name of the NIAMDD to the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases, extensively revised its authorities, and reauthorized its programs for 3 years; and required the NINCDS to conduct a study and submit a report on spinal cord regeneration and other neurological research.

December 17, 1980—P.L. 96-541 extended for 1 year the tax exemption on NRSA's.

August 13, 1981—P.L. 97-35, the Omnibus Budget Reconciliation Act of 1981, reauthorized NRSA's for 2 years through FY 1983, reauthorized the Medical Libraries Assistance program for 1 year, and repealed the prohibition in Title X against using other PHS authority to fund population research, thus eliminating the need for reauthorizations for this program located in the NICHD.

July 22, 1982—The Small Business Innovation Development Act of 1982 requires that each Federal agency with an annual research and development budget exceeding $100 million set aside a certain portion of its extramural R&D budget for a Small Business Innovation Research (SBIR) program as follows: 0.2 percent in FY 1983; 0.6 percent in FY 1984; 1.0 percent in FY 1985; and 1.25 percent in FY 1986 and all subsequent years. (P.L. 97-219.)

September 3, 1982—The Tax Equity and Fiscal Responsibility Act of 1982, included among its provisions an extension of the partial exclusion of NRSA's from taxable gross income. This extension will expire at the end of calendar year 1983; during this time, the Treasury Department will complete a study of the taxability of NRSA's and other government educational grants which, like NRSA's, have payback or service requirements. (P.L. 97-248.)

January 4, 1983—The Orphan Drug Act made changes in the law to encourage development and marketing of orphan drugs (drugs for rare diseases or conditions which are not economically feasible for private industry to develop and market). The act also includes requirement to prepare radioepidemiological tables relating radiation-related cancer to specific radiation doses, and a report on the risks of thyroid cancer associated with doses of I_{131}. These responsibilities were assigned to NIH and NCI respectively. The act further provided that NHLBI help develop and support not less than 10 comprehensive sickle cell centers. (P.L. 97-414.)

July 30, 1983—The supplemental appropriations for FY 1983 provided funds for PHS AIDS activities, $9.375 million of which was earmarked for NIH. This marked the first time the Congress directly appropriated money for AIDS research for NIH. The supplemental also provided $5.9 million for NLM and development of a Biomedical Information Communication Center in Portland, Oreg. (P.L. 98-63.).

October 1 and **November 17, 1983,** Continuing appropriations.—The first continuing resolution provided funding through November 10, 1983, until enactment of a regular appropriations bill for FY 1984. This and the subsequent CR, which continued funding through the remainder of FY 1984, also continued support for unauthorized NIH programs which include NRSA's, National Arthritis Advisory Board, National Diabetes Advisory Board, National Digestive Disease Advisory Board, and Medical Library Assistance programs. (P.L. 98-107 and P.L. 98-151.)

May 24, 1984—P.L. 98-297 designated the convent and surrounding land as the Mary Woodard Lasker Center for Health Research and Education.

October 9, 1984—The National Organ Transplant Act authorized the Secretary to establish a Task Force on Organ Procurement and Transplantation to examine relevant issues and report to the Congress within 12 months. Its membership included the Director, NIH, ex officio. OMAR will sponsor the required conference on bone marrow transplantation. (P.L. 98-507.)

October 12 and **November 8, 1984**—Appropriations legislation reauthorized NRSA's, provided construction funds for NIH, and medical library funding. (P.L. 98-473, P.L. 98-619.)

October 24, 1984—The Veterans' Dioxin and Radiation Exposure Compensation Standards Act required the Director, NIH, to conduct a study of devices and techniques for determining previous radiation exposure and submit a report; to enter into an interagency agreement with the VA Administrator to identify agencies capable of furnishing such services; and to provide an independent expert who could prepare radiation dose estimates for use by VA Administrator in adjudicating claims. (P.L. 98-542.)

Biographical Sketches of the Directors of the National Institutes of Health

Joseph James Kinyoun, M.D.
Founder and Director of the Hygienic Laboratory, Dr. Joseph J. Kinyoun introduced scientific research into the Marine Hospital Service. His interest in bacteriology and his isolation of the cholera organism laid the

Directors of the National Institutes of Health

Name	*Date of Birth*	*Dates of Office*	
Joseph J. Kinyoun	Nov. 25, 1860	Aug. 1887—	Apr. 30, 1899 [1]
Milton J. Rosenau	Jan. 1, 1869	May 1, 1899—	Sept. 30, 1909
John F. Anderson	Mar. 14, 1873	Oct. 1, 1909—	Nov. 19, 1915
George W. McCoy	June 4, 1876	Nov. 20, 1915—	May 25, 1930
		May 26, 1930—	Jan. 31, 1937 [2]
Lewis R. Thompson	Aug. 6, 1883	Feb. 1, 1937—	Jan. 31, 1942
Rolla E. Dyer	Nov. 4, 1886	Feb. 1, 1942—	June 15, 1948
		June 16, 1948—	Sept. 30, 1950 [3]
William H. Sebrell, Jr	Sept. 11, 1901	Oct. 1, 1950—	July 31, 1955
James A. Shannon	Aug. 9, 1904	Aug. 1, 1955—	Aug. 31, 1968
Robert Q. Marston	Feb. 12, 1923	Sept. 1, 1968—	Jan. 21, 1973
Robert S. Stone	Feb. 10, 1922	May 29, 1973—	Jan. 31, 1975
Donald S. Fredrickson	Aug. 8, 1924	July 1, 1975—	June 30, 1981
James B. Wyngaarden	Oct. 19, 1924	Apr. 29, 1982—	

[1] *Director, Hygienic Laboratory.*

[2] *Director, National Institute of Health.*

[3] *Director, National Institute of Health.*

Dr. Kinyoun
1887–1899

Dr. Rosenau
1899–1909

Dr. Anderson
1909–1915

Dr. McCoy
1915–1937

Dr. Thompson
1937–1942

Dr. Dyer
1942–1950

Dr. Sebrell
1950–1955

Dr. Shannon
1955–1968

Dr. Marston
1968–1973

Dr. Stone
1973–1975

Dr. Fredrickson
1975–1981

Dr. Wyngaarden
1982–

groundwork for the present health research program of NIH.

Born in East Bend, N.C., on November 25, 1860, Dr. Kinyoun received his M.D. degree from New York University in 1882 and did postgraduate work in Europe under the German bacteriologist, Robert Koch.

Dr. Kinyoun joined the Marine Hospital Service in 1886. In a one-room laboratory on Staten Island, N.Y., he applied new techniques he had learned in Europe, enabling him to isolate the organism that causes cholera. The Hygienic Laboratory was established in August 1887 and Dr. Kinyoun served as its Director until April 30, 1899.

During his government career, Dr. Kinyoun designed the Kinyoun-Francis sterilizer, a shipboard disinfecting apparatus. In 1903 he retired from public service, and after working in private industry and as a professor at the George Washington University, he became a bacteriologist in the District of Columbia Health Department, a post which he held until his death on February 14, 1919.

Milton Joseph Rosenau, M.D.
As second Director of the Hygienic Laboratory, Dr. Milton J. Rosenau was responsible for widely expanding its scope of investigations.

Dr. Rosenau was born in Philadelphia on January 1, 1869. After receiving his M.D. from the University of Pennsylvania, he did postgraduate work in Europe in the field of sanitation and public health.

In 1890 he received his commission in the Marine Hospital Service. He became Director of the Hygienic Laboratory on May 1, 1899.

A pioneer in the study of anaphylaxis, he also conducted research on yellow fever, malaria, typhoid fever, poliomyelitis, disinfectants, and the pasteurization of milk. His *Preventive Medicine and Hygiene* is a standard text for students of public health.

On September 30, 1909, Dr. Rosenau resigned from government service to join the staff of Harvard Medical School. In 1936 he went to the University of North Carolina where he served as director of the Public Health School until his death on April 9, 1946.

John F. Anderson, M.D.
Dr. John F. Anderson, third Director of the Hygienic Laboratory, was among the early scientists who made the Laboratory well-known in scientific circles.

Dr. Anderson was born in Fredericksburg, Va., March 14, 1873. After receiving his M.D. degree at the University of Virginia, he went abroad to study bacteriology. Upon returning in 1898, he joined the Marine Hospital Service and on October 1, 1909, succeeded Dr. Rosenau as Director of the Hygienic Laboratory.

Throughout his career in the service, he was actively engaged in research. He studied serum and vaccine therapy, immunology, cholera, typhus, poliomyelitis, and public health and sanitation problems. He worked with Dr. Rosenau on hypersusceptibility, anaphylaxis, and tuberculosis, and with Dr. Joseph Goldberger on the transmisson of measles to monkeys, providing science with an experimental animal for that disease.

Dr. Anderson served as Director of the Hygienic Laboratory until November 19, 1915, when he resigned to become director of the Research and Biological Laboratories and later vice president of E. R. Squibb & Sons. He died on September 29, 1958.

George Walter McCoy, M.D.
Dr. George W. McCoy was during his lifetime the Nation's greatest authority on leprosy. For his many contributions to public health, he won the Sedgwick Memorial Medal of the American Public Health Association in 1921.

Born in Cumberland Valley, Pa., on June 4, 1876, he entered the Marine Hospital Service in 1900 after graduating from the University of Pennsylvania Medical School.

During his first assignment at the Marine hospital in San Francisco, he became interested in leprosy. While heading the U.S. Plague Laboratory in San Francisco from 1908 to 1911, he discovered that the California ground squirrel was responsible for the spread of the organism causing tularemia.

On November 20, 1915, he became fourth Director of the Hygienic Laboratory, renamed "National Institute of Health" in 1930. During this period he conducted important studies in influenza, poliomyelitis, smallpox, tularemia, amoebic dysentery, and pneumonia. Dr. McCoy served as Director until January 31, 1937.

After conducting a nationwide survey on leprosy, Dr. McCoy retired from PHS on June 30, 1938, and joined the staff of Louisiana State University in New Orleans. He died on April 2, 1952.

Lewis Ryers Thompson, M.D.
Dr. Lewis R. Thompson was intensely interested in research on industrial health problems and on problems of stream pollution.

Born in Lafayette, Ind., August 6, 1883, he joined PHS in 1910, having graduated from Louisville Medical College. After becoming chief of the Divison of Scientific Research in 1930, he administered field investigations of stream pollution, malaria, cancer, nutritional diseases, child hygiene, milk, dental problems, and industrial hygiene. When the Division was merged with NIH,

Dr. Thompson became Director on February 1, 1937.

Dr. Thompson was largely responsible for securing the present-day site of NIH and for securing appropriations for the construction of the first six buildings. He served as Director until January 31, 1942, and after retiring from PHS in 1947 became a scientific director of the international health division of the Rockefeller Foundation. He died on November 12, 1954.

Rolla Eugene Dyer, M.D.

Dr. Rolla E. Dyer's major research contributions were in the field of infectious diseases; in particular, endemic typhus. He demonstrated how endemic typhus is spread and helped develop a vaccine to protect against the disease.

Born in Delaware County, Ohio, November 4, 1886, Dr. Dyer received his M.D. from the University of Texas and joined PHS in 1916.

His first assignment involved fieldwork on bubonic plague in New Orleans. Five years later he joined the staff of the Hygienic Laboratory, became chief of the Division of Infectious Diseases in 1936, and Director of NIH in 1942.

As Director, Dr. Dyer organized the Division of Research Grants, assisted in planning the Clinical Center, and helped establish three new Institutes: the National Heart Institute, the National Institute of Dental Research, and National Institute of Mental Health.

After retiring from active duty on September 30, 1950, Dr. Dyer served as a member of the scientific board of directors of the international health division of the Rockefeller Foundation. He died June 2, 1971.

William Henry Sebrell, Jr., M.D.

A leading international authority on nutrition, Dr. William H. Sebrell first recognized and described the dietary deficiency disease, ariboflavinosis, and made significant contributions to knowledge of dietary needs and deficiencies.

Born in Portsmouth, Va., on September 11, 1901, Dr. Sebrell received his M.D. degree from the University of Virginia and joined PHS in 1926.

He began his research career under Dr. Joseph Goldberger who demonstrated that pellagra is a deficiency disease. During the 1930's, Dr. Sebrell made many important contributions to our knowledge of the anemias and the role of diet in cirrhosis of the liver.

During World War II, Dr. Sebrell was codirector of the National Nutrition Program which coordinated activities of all state agencies working in the field of nutrition. This program aided food production and the maintenance of civilian health during the war years.

In 1948 he became Director of the Experimental Biology and Medicine Institute, and on October 1, 1950, was appointed Director of NIH. He held this post until his retirement on July 31, 1955.

Dr. Sebrell helped formulate the first international standards of nutrition for the League of Nations, and pioneered in gaining acceptance of scientific nutrition as a regular function of modern state and local health departments.

James A. Shannon, M.D.

Dr. James A. Shannon, widely recognized in the scientific world for his original research in kidney function, chemotherapy, and malaria, has throughout his career, been devoted to medical research, teaching, and public service.

Born in Hollis, N.Y., on August 9, 1904, he received his M.D. in 1929 and a Ph. D. in physiology in 1935 from New York University.

Following his internship at Bellevue Hospital in New York, he taught in the department of physiology at New York University College of Medicine from 1931 to 1941, and directed research at the university's Goldwater Memorial Hospital from 1940 to 1945.

During periods of leave, he served as guest investigator at the physiological laboratory, University of Cambridge, England, and as a member of the staff of the Marine Biological Laboratory at Woods Hole, Mass.

During World War II, Dr. Shannon played a prominent part in malaria research activities of the National Research Council and was consultant on tropical diseases to the Secretary of War. In recognition of this work, he received the Presidential Medal for Merit, the highest award at that time for civilian service in government.

Before joining PHS in 1949, Dr. Shannon was director of the Squibb Institute for Medical Research (1946–49), and special consultant to the PHS Surgeon General.

He then served as associate director in charge of research in the National Heart Institute until 1952. After holding the post of Associate Director, NIH, for 3 years, Dr. Shannon became its Director on August 1, 1955.

Among his many honors are the Public Welfare Medal of the National Academy of Sciences for "eminence in the application of science to the public welfare" (1962), the Rockefeller Public Service Award for Science, Technology, or Engineering (1964), and the Presidential Distinguished Federal Civilian Service Award (1966).

On retiring as NIH Director (August 31, 1968), Dr. Shannon joined the National Academy of Sciences as special advisor to the president. In February 1970 he became professor and special assistant to the president, Rockefeller University. He retired

from those positions in 1975, and now resides in Portland, Oreg.

Robert Q. Marston, M.D.

Dr. Robert Quarles Marston became Director of NIH on September 1, 1968, after serving for 5 months as Administrator of the Health Services and Mental Health Administration.

Born in Toano, Va., on February 12, 1923, he received his B.S. degree in 1943 from the Virginia Military Institute, and his M.D. from the Medical College of Virginia in 1947. As a Rhodes scholar, he worked for the next 2 years with Nobel prizewinner Howard Florey at Oxford University, Oxford, England, earning a B. Sc. from that institution in 1949.

After an internship at Johns Hopkins Hospital and a year's residency at Vanderbilt University Hospital in Nashville, Tenn., he was stationed at NIH from 1951 to 1953 as a member of the Armed Forces Special Weapons Project, conducting research on the role of infection after whole body irradiation. He completed his residency at the Medical College of Virginia in Richmond the following year.

While a Markle fellow, he served as assistant professor of medicine at the Medical College of Virginia from 1954 to 1957, and as assistant professor of bacteriology and immunology at the University of Minnesota in Minneapolis for 1 year. He returned to the Medical College of Virginia in 1959 as associate professor of medicine and assistant dean in charge of student affairs.

In 1961, he became director of the University of Mississippi Medical Center and dean of the School of Medicine in Jackson, Miss., and was appointed vice chancellor there in 1965.

He became an Associate Director of NIH and director of the newly created Division of Regional Medical Programs on February 1, 1966.

On April 1, 1968, Dr. Marston was named Administrator of the Health Services and Mental Health Administration, under a Departmental reorganization.

He became Acting Director of the National Institute of Neurological Diseases and Stroke on January 21, 1973. He left the Federal service in April 1973 to become a scholar-in-residence at the University of Virginia. He also was named the first distinguished fellow of the Institute of Medicine, National Academy of Sciences.

On January 11, 1974, Dr. Marston was named president of the University of Florida at Gainesville.

Robert S. Stone, M.D.

Dr. Robert S. Stone, former vice president for health services and dean of the School of Medicine at the University of New Mexico, became Director of NIH on May 29, 1973.

Born February 10, 1922, in New York City, he received his B.A. in 1942 from Brooklyn College and his M.D. from the State University of New York College of Medicine in 1950. Dr. Stone was an instructor in pathology at Columbia University College of Physicians and Surgeons from 1950 to 1952.

Following his 1950–1952 internship and assistant residency in pathology at New York's Presbyterian Hospital, Dr. Stone moved to Los Angeles and joined the faculty of UCLA's School of Medicine, department of pathology.

From 1957 to 1959 as part of his academic duties he was deputy coroner at Los Angeles County, and for several years was pathologist for the Los Angeles Shriners Hospital for Crippled Children.

While on sabbatical as a visiting scientist at the Rockefeller Institute in 1959, he was credited with demonstrating by electron microscopy that the Shope papilloma virus of rabbits could be found in mature skin cells, but was undetectable, although presumed present, in younger growing cells.

Based on his observation of autopsies of atomic bomb victims in Hiroshima, Japan, Dr. Stone was one of the first researchers to suggest that radiation exposure increases the incidence of certain known diseases rather than creating new types. Dr. Stone served as chief of research in pathology for the Atomic Bomb Casualty Commission from 1959 to 1960.

He contributed to the concept of developing a method control population to study the normal incidence of various diseases for comparison, as was subsequently done.

It was as a result of this work and his continuing interest that he was appointed to the National Academy of Sciences Advisory Committee on the Atomic Bomb Casualty Commission.

Dr. Stone joined the University of New Mexico School of Medicine as chairman of the department of pathology in 1963, and became dean of the school in 1968. Prior to his appointment as NIH Director, Dr. Stone took a year's leave from the university and was a visiting professor at the Sloan School of Management, Massachusetts Institute of Technology.

Dr. Stone became dean of the School of Medicine of the University of Oregon Health Sciences Center and vice president of the Health Sciences Center in August 1975. He has since been appointed dean of the College of Medicine at Texas A & M University in August of 1978.

Donald S. Fredrickson, M.D.

Dr. Donald S. Fredrickson, internationally known authority on

lipid metabolism and its disorders, became Director of the National Institutes of Health on July 1, 1975. Immediately prior to this appointment, Dr. Fredrickson had served for 1 year (1974–1975) as president of the Institute of Medicine, National Academy of Sciences.

His association with NIH, however, spans more than two decades beginning in 1953 when he joined the scientific staff of the then National Heart Institute (renamed the National Heart, Lung, and Blood Institute in 1976) as a clinical associate.

During his long research career in the Federal service, Dr. Fredrickson has held numerous positions at NIH, several in the Heart Institute simultaneously. From 1955 to 1961 he was a member of the Laboratory of Cellular Physiology and Metabolism. He then served as clinical director (1961–1966), while continuing his research as head of the Section of Molecular Diseases, Laboratory of Metabolism (1962–1966). He was appointed Institute Director in 1966, serving in that capacity until 1968. He combined this executive responsibility with research as chief of the Molecular Diseases Branch (1966–1974), and as director of intramural research (1969–1974).

His earliest research interests centered on the metabolism of sterols. Later he focused on the structure of the plasma lipoproteins, their importance in the transport of fats, and the genetic factors regulating their metabolism and concentration in blood. It was during this period that he discovered two new genetic disorders: Tangier disease (absence of high density lipoproteins) and cholesteryl ester storage disease, a lysosomal enzyme deficiency.

In 1965, Dr. Fredrickson and his coworkers introduced a system for identifying and classifying blood-lipid abnormalities on the basis of plasma lipoprotein patterns. From this work came recognition of new monogenic causes of hyperlipidemia: type 3 and type 5 hyperlipoproteinemia and what is called familial hypertriglyceridemia. The system received prompt acceptance by the World Health Organization and is now used widely by laboratories around the world.

Research findings of Dr. Fredrickson and colleagues have also included the discovery of several previously unknown apolipoproteins, and new knowledge including descriptions concerning the structure and function of various apoproteins.

Dr. Fredrickson was born August 8, 1924, in Canon City, Colo. He received both his B.S. (1946) and M.D. (1949) from the University of Michigan, and was certified by the American Board of Internal Medicine in 1957. He did postgraduate work at Peter Bent Brigham and Massachusetts General Hospitals and the Harvard Medical School prior to coming to NIH in 1953.

He is a member of numerous professional societies in addition to the National Academy of Sciences and the American Academy of Arts and Sciences.

Dr. Fredrickson's research achievements have won him many honors and awards. The most recent of these was the Gairdner Award (1978). He is also the recipient of several honorary degrees, including an honorary doctor of medicine from the Karolinska Institutet (1977).

He resigned as NIH Director on June 30, 1981, returning to the NAS as a visiting scholar.

James B. Wyngaarden, M.D.

Dr. James B. Wyngaarden, an internationally recognized authority on the regulation of purine biosynthesis and the genetics of gout, and a nationally respected advisor on various aspects of the administration of biomedical research, became the 12th Director on April 30, 1982. Immediately prior to his appointment, he was professor and chairman of the department of medicine at Duke University School of Medicine, a position he had held since 1967.

He has had a long association with the NIH. From 1953 to 1954, he was a research associate in the Laboratory of Chemical Pharmacology of the then National Heart Institute, and from 1954 to 1956, he was a clinical associate at the then National Institute of Arthritis and Metabolic Diseases. After leaving in 1956 to become associate professor at the Duke University School of Medicine, he continued an association with NIH. He has held grants from several NIH components.

Dr. Wyngaarden has been active on various NIH study groups, evaluation committees, and review panels over the years, including a term with the Board of Scientific Counselors of the then NIAMD (1971–1974). He also served as a scientific consultant to the NIH as a member of study sections (1958–1960; 1967–1969).

He has also served as advisor to the broader scientific community as a member of the National Academy of Sciences since 1974, and was active from 1975 to 1982 on an NAS committee set up to study the Nation's overall need for biomedical and behavioral researchers; consultant for the President's Office of Science and Technology (1966–1972), a member of the President's Science Advisory Committee (1972–1973), and a member of the U.S. Atomic Energy Commission's Advisory Committee on Biology and Medicine.

Dr. Wyngaarden is the coauthor of *Cecil Textbook of Medicine,* now in its 17th edition. In collaboration with former NIH Director, Dr.

Donald S. Fredrickson, and others, he edited the book, *The Metabolic Basis of Inherited Disease*, which is now in its fifth edition. The original work was published in 1960.

Dr. Wyngaarden was born October 19, 1924, in East Grand Rapids, Mich., attended Calvin College there, and Western Michigan University in 1943–1944. In 1948 he graduated first in his class from the University of Michigan Medical School.

He trained in internal medicine at the Massachusetts General Hospital and did postdoctoral work at the Public Health Research Institute of the City of New York, under the direction of Dr. DeWitt Stetten, Jr., former NIGMS Director. After serving as research associate at NIH from 1953 to 1956, he went to Duke University School of Medicine and in 1959 became director of the medical research training program there as well as associate professor of medicine and biochemistry. In 1961 he became professor of medicine and associate professor of biochemistry.

In 1963 and 1964, Dr. Wyngaarden was a visiting scientist at the Institut de Biologie-Physiocochemique in Paris. Shortly after his return to this country, he left Duke to become professor and chairman of the department of medicine and professor of biochemistry at the University of Pennsylvania. He returned to Duke in 1967.

He is a diplomate of the American Board of Internal Medicine. He has served on editorial boards of numerous professional publications including the *Journal of Biological Chemistry, Arthritis and Rheumatism, Journal of Clinical Investigation, Annals of Internal Medicine*, and *Proceedings of the National Academy of Sciences*. He is a member of a number of professional societies including the National Academy of Sciences Institute of Medicine, the American Academy of Arts and Sciences, the American Society for Clinical Investigation, and is a past president of the Association of American Physicians.

Biographical Sketches of the Deputy Directors of the National Institutes of Health

Cassius James Van Slyke, M.D.

Dr. Van Slyke, first Deputy Director of NIH, served in that position from December 3, 1958, until his retirement on December 1, 1959. Born in Benton, Minn., on December 1, 1900, Dr. Van Slyke received his M.D. in 1928 from the University of Minnesota and entered the PHS reserve corps that same year.

In 1932, he was commissioned in the regular corps and from 1936 to 1944 pursued a distinguished research career at the PHS Venereal Disease Research Laboratory in Staten Island, N.Y. In 1944, he was made assistant chief, Venereal Disease Division, Washington, D.C.

Dr. Van Slyke joined NIH in 1946 as chief of the newly established Research Grants Office, later renamed the Division of Research Grants, serving there until named Director of NHI on August 1, 1948. He left NHI on November 30, 1952, to serve as Associate Director of NIH, a post he held until named NIH Deputy Director.

He died April 21, 1966.

David E. Price, M.D.

A native of San Diego, Calif., Dr. Price was born on July 5, 1914. He earned his medical degree at the University of California School of Medicine at Berkeley in 1940, and served his internship at the PHS Hospital in San Francisco. In 1946, he received his doctorate in public health at Johns Hopkins University School of Hygiene and Public Health.

Following a tour of duty in the Venereal Disease Division, PHS, he was assigned first to the DRG as assistant to the chief (1946–47) and then to the NCI as chief of the Research Grants Branch (1947–48). He returned to DRG in 1948 as chief, a post he held until he was named NIH Associate Director for Extramural Affairs (1950–52).

After a series of key appointments in the Office of the Surgeon General, the Bureau of Medical Services and the Bureau of State Services, Dr. Price was named Deputy Director of NIH on July 1, 1960. Two years later, he was appointed Deputy Surgeon General, PHS.

He retired from the service in 1965. Since his retirement, he has been associated with the Ford Foundation and the American Public Health Association.

Dr. Price was director of planning of the Medical Institutions, the Johns Hopkins Medical Institution, Baltimore, Md. He retired on July 1, 1980, from Johns Hopkins.

Stuart M. Sessoms, M.D.

Dr. Sessoms came to NIH in 1953 as a member of the NCI staff. From 1955 to 1957 he was assistant director of the Clinical Center. He was appointed assistant director, NCI, on January 1, 1958, prior to his appointment in November 1958 as chief of NCI's Cancer Chemotherapy National Service Center.

During this period, Dr. Sessoms served also as NCI associate director (1960), and associate director for collaborative research (1961) with responsibility for the Institute's Virology Research Resources Branch, in addition to his duties at the Cancer Chemotherapy National Service Center.

He became the third NIH Deputy Director on August 1, 1962, serving in that capacity until his retirement July 31, 1968. On

retirement, he held the rank of Assistant Surgeon General (Rear Admiral) in the Public Health Service.

During his career at NIH, Dr. Sessoms was the recipient of two Meritorious Service Awards for his accomplishments as head of the Cancer Chemotherapy National Service Center, and for "outstanding ability and achievements in the development, operation and staffing" of the Regional Medical Programs.

A native of Roseboro, N.C., he was born July 16, 1921. He received his B.S. in pharmacy at the University of North Carolina in 1943 and his M.D. from the Medical College of Virginia in 1946.

On retiring after 25 years of government service, Dr. Sessoms joined Duke University.

On Jan. 1, 1976, he was named president of Blue Cross and Blue Shield of North Carolina.

G. Burroughs Mider, M.D.

Dr. Mider, whose career at NIH reaches back to 1939, is well-known on the campus. Just prior to transferring to the National Library of Medicine, an NIH component, in 1968, Dr. Mider had served for 8 years as NIH Director of Laboratories and Clinics (1960–68), in which he functioned as Deputy Director as well.

He first came to NIH as a research fellow, NCI, in 1939. On completing the fellowship, he became an instructor in pathology and assistant professor of pathology (1941–44) at Cornell Medical College. Concurrently, he was an assistant pathologist at New York Hosptial.

Then followed assignments as associate professor of pathology at the University of Virginia School of Medicine (1944–45), and research associate in surgery and professor of cancer research, University of Rochester School of Medicine and Dentistry (1945–52).

On returning to NIH in 1952, he became NCI associate director in charge of research. In 1960 he was appointed NIH Director of Laboratories and Clinics. In May 1968, Dr. Mider transferred to the NLM as special assistant to the director for medical program development and evaluation. The following year he was named acting deputy director, and in 1970 became NLM deputy director.

In 1960, he was the recipient of a DHEW Distinguished Service Award. Dr. Mider retired from the Library on June 30, 1972, to accept the position of executive officer for the Universities Associated for Research and Education in Pathology, Inc., and the American Society of Experimental Pathology.

John F. Sherman, Ph. D.

Dr. Sherman was appointed Deputy Director of NIH on November 1, 1968, after a long career in research and research grants administration. He was designated by HEW Secretary Richardson as Acting Director of NIH on January 21, 1973, and served in that capacity until a new Director was appointed May 29, 1973. He then returned to the position of Deputy Director.

He came to NIH in January 1953 as a research pharmacologist in the Laboratory of Tropical Diseases, National Microbiological Institute which became the NIAID in 1955.

In July 1956, Dr. Sherman joined the staff of the NIAMD as assistant to the chief of extramural programs. He became assistant chief of the Institute's extramural programs in August 1957, and deputy chief in October 1958.

On July 1, 1961, he was appointed associate director for extramural programs, NINDB. He rejoined the NIAMD in 1962 as associate director for extramural programs, serving in that capacity until January 1, 1964, when he was named NIH Associate Director for Extramural Programs.

Dr. Sherman was born on September 4, 1919, in Oneonta, N.Y. He received his B.S. in 1949 from the Union University College of Pharmacy in Albany, N.Y., and his Ph. D. in pharmacology in 1953 from Yale University.

He is the author of numerous scientific papers and articles in his field of research. In 1971, he received a DHEW Distinguished Service Award.

Dr. Sherman left NIH in 1974 to become vice president of the Association of American Medical Colleges and director of the association's department of planning and policy development.

Robert W. Berliner, M.D.

Dr. Berliner, the first NIH Deputy Director for Science, is an internationally renowned renal physiologist whose research in the field has contributed to understanding of the control of the excretion of sodium and potassium salts.

For 12 years (1950–62), he was chief of the Laboratory of Kidney and Electrolyte Metabolism, NIH, and from 1954 to 1968 also served as the Institute's director of intramural research.

In 1968, he was appointed Director of Laboratories and Clinics, NHI. He was named to the newly created post of Deputy Director for Science in 1969.

Prior to joining NIH in 1950, Dr. Berliner was assistant professor of medicine at Columbia University, and research associate with the New York City Department of Hospitals.

Born in New York City on March 10, 1915, he received his B.S. from Yale University and his M.D. from Columbia University in 1939. He served his internship and residency at the Presbyterian Hospital and Goldwater Memorial Hospital, respectively, both in New York.

Dr. Berliner was elected to the National Academy of Sciences in 1968. Other honors include the PHS Distinguished Service Award (1962), the Homer W. Smith Award (1965), the Modern Medicine Award for Distinguished Achievement (1969), and the American Heart Association's Research Achievement Award (1970).

Dr. Berliner left NIH to accept appointment as dean of the Yale University Medical School in September 1973.

DeWitt Stetten, Jr., M.D., Ph. D.
Dr. Stetten, an eminent medical educator and researcher in metabolic diseases, was named NIH Deputy Director for Science on March 17, 1974.

He was born on May 31, 1909, in New York City. He received his A.B. degree from Harvard College in 1930, and his M.D. and Ph. D. from Columbia University in 1934 and 1940, respectively. From 1934 to 1937, he took his internship and residency at Bellevue Hospital in New York. Dr. Stetten then joined the staff at Columbia University for 9 years, serving successively as assistant instructor and assistant professor of biochemistry. In 1947, he was appointed assistant professor in biological chemistry at the Harvard Medical School. From 1948 to 1954, he was chief of the division of nutrition and physiology for the Public Health Research Institute of New York City.

Dr. Stetten first came to NIH in 1954 as director of the intramural research program of the National Institute of Arthritis and Metabolic Diseases. In that capacity, he directed Institute programs on basic and clinical research in diabetes, vitamin deficiencies, and disorders of the blood, bone, and liver. He left NIH in 1962 to become the first dean of the Rutgers Medical School, a position he held until his return to NIH on October 1, 1970, as Director of the National Institute of General Medical Sciences.

The American Diabetes Association awarded Dr. Stetten the Banting Medal in 1957. In 1963, he delivered the 22nd annual NIH Lecture on the History and Natural History of Gout.

Among his many honors are the DHEW Superior Service Honor Award (1973) for "scientific and managerial leadership in initiating new programs in genetics and in the cellular basis of diseases" and for services as a spokesman for the lasting values of science, and the DHEW Distinguished Service Award (1977).

He has also received honorary D.Sc. degrees from Washington University (1974), and from the College of Medicine and Dentistry of New Jersey (1976).

Author of more than 100 original papers in his field of research, and coauthor of the early editions of the textbook, *Principles of Biochemistry,* Dr. Stetten has served on the editorial boards of numerous scientific and medical journals, including *Science, Physiological Reviews, American Journal of Medicine, Metabolism, Journal of Chronic Diseases, Journal of Biological Chemistry,* and *Perspectives in Biology and Medicine.* He was president of the Foundation for Advanced Education in the Sciences (1972–1974), and is a member of the National Academy of Sciences (since 1974), and the NAS Council (since 1976). He was president of the Society for Experimental Biology and Medicine, 1977–1979.

Dr. Stetten was named senior scientific advisor to the NIH Director in September 1979.

Ronald W. Lamont-Havers, M.D.
Dr. Lamont-Havers, internationally known rheumatologist, was appointed Deputy Director of NIH on August 4, 1974, after serving in an acting capacity since May 20.

Prior to this appointment, he had been deputy director of the National Institute of Arthritis, Metabolism, and Digestive Diseases (1972–74), and NIH Associate Director for Extramural Research and Training for 4 years (1968–72).

A native of England, Dr. Lamont-Havers was born on March 6, 1920. He received his B.A. in 1942 from the University of British Columbia, Canada, and M.D. in 1946 from the University of Toronto. He took staff and residency training (1946–48) at the Vancouver General Hospital, and residency in internal medicine (1949–51) at the Queen Mary Veterans Hospital in Montreal. From 1951 to 1953, he was a fellow of the Canadian Arthritis and Rheumatism Society at Columbia Presbyterian Hospital, College of Physicians and Surgeons, Columbia University. He also received a diploma in internal medicine in 1953 from McGill University.

He came to NIH in 1964 as associate director for extramural programs, NIAMD. From 1955 to 1964 he was national medical director of the Arthritis Foundation, during which time he was also an instructor in medicine, College of Physicians and Surgeons, Columbia University. Previously, he served as medical director of the Canadian Arthritis and Rheumatism Society, British Columbia Division, Vancouver, from 1953 to 1955, and as associate medical director, Student Health Service, University of British Columbia (1948–49).

Dr. Lamont-Havers, author or coauthor of numerous papers on arthritis and rheumatism, was honored in June 1973 with a DHEW Superior Service Award.

He left NIH in September 1976 to become deputy for research policy and administration to the general director, Massachusetts General Hospital, Boston.

Thomas E. Malone, Ph. D.

Dr. Malone, whose career at the NIH goes back to 1962, was named the sixth Deputy Director of NIH in March 1977.

He was born in Henderson, N.C., on June 3, 1926. He received his B.S. and M.S. degrees from North Carolina Central University in 1948 and 1949 respectively, and his Ph. D. from Harvard University in 1952. During the period 1950–1952 he held a teaching fellowship at Harvard University.

Dr. Malone was professor of zoology at N.C. Central University in Durham from 1952 to 1958. He left that position to accept a postdoctoral fellowship of the NAS-National Research Council, serving as a resident research associate at Argonne National Laboratory from 1958 to 1959. He subsequently served on the faculty at Loyola University in Chicago until joining the NIH staff in 1962.

He came to NIH as a member of the Grants Associates Program. After completing a year's training, he joined the staff of the National Institute of Dental Research in 1963, serving in several capacities—from 1963 to 1964 he was assistant chief of the Research Grants Section; 1964 to 1966, deputy chief, extramural programs; and 1966 to 1967, chief, periodontal diseases and soft tissue studies, extramural programs.

In 1967 Dr. Malone accepted a position as professor and chairman of the department of biology at the American University of Beirut, Lebanon. He returned to NIDR in 1969, where he was associate director for extramural programs until 1972 when he was appointed NIH Associate Director for Extramural Research and Training, a position which he held until his appointment as Deputy Director of NIH.

He is a member of the Institute of Medicine (NAS) and of numerous other professional organizations in health research and administration.

In June 1971 Dr. Malone received the DHEW Superior Service Award "in recognition of his inspired leadership in fostering and stimulating grant-supported research and research training in dental science and oral disease." He was honored in April 1974 with the DHEW Distinguished Service Award "in recognition of his outstanding leadership and contributions in the direction of the extramural research and training programs of the National Institutes of Health." In October 1975 the American College of Dentists presented him with a Certificate of Merit "in recognition of his distinguished services to the dental profession." He received a Senior Executive Service Presidential Merit Award in 1980 and a Senior Executive Service Presidential Distinguished Executive Rank Award in 1983.

He served as a member of the U.S. Delegation to the 31st through 35th World Health Assemblies and has participated in numerous other international health activities.

Upon the resignation of Dr. Donald S. Fredrickson, Dr. Malone was named Acting Director, NIH, until the appointment of Dr. Wyngaarden.

Robert Goldberger, M.D.

A highly regarded scientist in the biomedical research community, Dr. Goldberger became NIH Deputy Director for Science in September 1979.

After receiving his A.B. degree from Harvard College in 1954, he attended the New York University Medical School, where he obtained an M.D. in 1958. He interned at Mt. Sinai Hospital in New York, and then spent 2 years as a postdoctoral fellow at the University of Wisconsin's Institute for Enzyme Research. He came to the NIH as a research associate in the National Heart Institute in 1961, working with Dr. C. B. Anfinsen on the mechanism by which newly synthesized polypeptide chains attain the three-dimensional structures characteristic of native proteins. In 1963 he was a visiting scientist at the Weizmann Institute of Science.

Dr. Goldberger served as a biochemist in the Laboratory of Chemical Biology, NIAMD, from 1963 to 1966, when he became chief of that laboratory's Biosynthesis and Control Section. He worked on regulation of gene expression in bacteria.

In 1973 he moved to the NCI's Division of Cancer Biology and Diagnosis, where, as chief of the Cellular Regulation Section, he worked on hormonal regulation of gene expression in avian liver.

A member of the editorial boards of the *Journal of Biological Chemistry* and *Nucleic Acids Research,* Dr. Goldberger has written one book on biochemistry and has edited a multivolume treatise on biological regulation. From 1970 to 1971 he served as president of NIH's Inter-Assembly Council of the Assemblies of Scientists. He received the Superior Service Award, DHEW, in 1973 and the Meritorious Service Medal, USPHS, in 1977.

At the end of June 1981, he left NIH to accept a dual position as provost of Columbia University and vice president for health sciences, and as a professor of chemistry.

William F. Raub, Ph.D.

Dr. Raub was appointed Deputy Director for Extramural Research and Training in June 1983. He coordinates the development and implementation of policies affecting extramural programs.

He was NIH Associate Director for Extamural Research and Training previous to this appointment. He has served as associate director, National Eye

Institute (1975–1978), and chief , Biotechnology Resources Branch, Division of Research Resources (1969–1975). He joined NIH in 1966.

Dr. Raub led the effort to develop the PROPHET system, a national computer resource for pharmacologists and others who study chemical/biological interactions. PROPHET is the most nearly comprehensive set of information-handling tools for this area of science ever to be presented in a unified system, and offered as a service to the biomedical community.

A graduate of Wilkes College in Wilkes-Barre, Pa., in 1961, he received his Ph.D. in 1965 from the University of Pennsylvania.

In 1982 Dr. Raub received the HHS Distinguished Service Award and the SES Meritorious Executive Rank Award.

Joseph E. Rall, M.D., Ph.D.

Dr. Rall was appointed Deputy Director for Intramural Research in June 1983. He advises the NIH Director on general scientific matters and intramural research policies and coordinates the intramural research program.

With NIH since 1955, he was director of the division of intramural research at the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases for more than 20 years.

Dr. Rall received his M.D. from Northwestern University School of Medicine (1945) and Ph.D. from the University of Minnesota (1952). He has received honorary degrees from North Central College, Naperville, I11. (1966), and Free University of Brussels (1975). He was elected to the National Academy of Sciences in 1980.

He is a member of many organizations and the coauthor of more than 160 scientific articles. His research involves the areas of thyroid hormones, iodine metabolism, and thyroid diseases.

In addition to the Van Meter Prize (1950) and the Robert Williams Distinguished Leadership Award of the Endocrine Society (1983), Dr. Rall has received the Authur S. Flemming Award (1959), the DHHS Superior Service Award (1965) and Distinguished Service Award (1968). He achieved Distinguished Executive Rank in the Senior Executive Service in 1980.

Deputy Directors of the National Institutes of Health

Name	*Date of birth*	*Dates of office*	
C. J. Van Slyke	Dec. 1, 1900	Dec. 3, 1958—	Dec. 1, 1959
David E. Price	July 5, 1914	July 1, 1960—	June 30, 1962
Stuart M. Sessoms	July 16, 1921	Aug. 1, 1962—	July 31, 1968
G. Burroughs Mider [1]	Aug. 9, 1907	July 1, 1960—	May 19, 1968
John F. Sherman	Sept. 4, 1919	Nov. 1, 1968—	Mar. 16, 1974
Robert W. Berliner [2]	Mar. 10, 1915	Feb. 23, 1969—	Sept. 1, 1973
DeWitt Stetten, Jr. [2]	May 31, 1909	Mar. 17, 1974—	Sept. 11, 1979
Ronald W. Lamont-Havers	Mar. 6, 1920	Aug. 4, 1974—	Sept. 25, 1976
Thomas E. Malone	June 3, 1926	Mar. 24, 1977	.....
Robert Goldberger [2]	June 2, 1933	Sept. 11, 1979—	June 26, 1981
Joseph E. Rall [3]	Feb. 3, 1920	July 2, 1981—	June 6, 1982
Philip S. Chen, Jr. [3]	July 3, 1932	June 7, 1982	Mar. 18, 1983
William F. Raub [4]	Nov. 25, 1939	Apr. 3, 1983	
Joseph E. Rall [5]	Feb 3, 1920	June 1983	

[1] Had title "Director of Laboratories and Clinics."
[2] For Science.
[3] For Science, Acting.
[4] For Extramural Research and Training.
[5] For Intramural Research.

Associate Directors of the National Institutes of Health

Name	*Date of birth*	*Dates of office*	
Norman H. Topping	Jan. 12, 1908	1948	1952
David E. Price	July 5, 1914	Dec. 1, 1950	Nov. 30, 1952
James A. Shannon	Aug. 9, 1904	Nov. 1, 1952	July 31, 1955
C. J. Van Slyke	Dec. 1, 1900	Dec. 1, 1952	Dec. 2, 1958
Joseph E. Smadel	Jan. 10, 1907	May 1, 1956	June 30, 1960
Kenneth M. Endicott	June 6, 1916	Jan. 6, 1958	June 30, 1960
Jack Masur	June 16, 1908	July 1, 1960	Mar. 8, 1969
Charles V. Kidd	Jan. 22, 1914	Sept. 13, 1960	Dec. 9, 1964
Ernest M. Allen	Dec. 1, 1904	Aug. 10, 1960	Jan. 8, 1963
Martin M. Cummings	Sept. 7, 1920	July 11, 1963	Jan. 1, 1964
John F. Sherman	Sept. 4, 1919	Jan. 1, 1964	Oct. 31, 1968
Robert Q. Marston	Feb. 12, 1923	Feb. 1, 1966	Mar. 31, 1968
Thomas J. Kennedy, Jr	June 6, 1920	Aug. 8, 1968	Aug. 31, 1974
R. W. Lamont-Havers	Mar. 6, 1920	Nov. 3, 1968	Oct. 1, 1972
Richard L. Seggel	Jan. 11, 1914	Jan. 4, 1969	Nov. 28, 1971
Leonard D. Fenninger	Oct. 3, 1917	Nov. 10, 1969	May 4, 1973
Thomas C. Chalmers	Dec. 8, 1917	Feb. 9, 1970	Oct. 20, 1973
Storm Whaley	Mar. 15, 1916	July 1, 1970	
Leon M. Schwartz	Apr. 26, 1928	Feb. 6, 1972	June 30, 1979
Thomas E. Malone	June 3, 1926	Nov. 26, 1972	Mar. 24, 1977
Leon Jacobs	Mar. 26, 1915	July 30, 1972	July 3, 1978
Robert S. Gordon, Jr	Mar. 26, 1926	Jan. 7, 1974	Sept. 1, 1975
Joseph G. Perpich	July 22, 1941	Feb. 15, 1976	Dec. 12, 1981
Mortimer Lipsett	Feb. 20, 1921	Aug. 29, 1976	June 30, 1982
Seymour Perry	May 26, 1921	Jan. 3, 1978	March 1980
William F. Raub	Nov. 25, 1939	Apr. 4, 1978	Apr. 2, 1983
Charles U. Lowe (Acting)	Aug. 24, 1921	Jan. 3, 1980	July 9, 1982
Edwin D. Becker	May 3, 1930	March 1980	
Calvin Baldwin	Dec. 22, 1925	Aug. 4, 1980	
Mark S. Beaubien (Acting)	Oct. 20, 1921	July 1, 1982	Jan. 18, 1984
Jay R. Shapiro (Acting)	July 26, 1931	July 1, 1982	
J. Richard Crout	Dec. 30, 1929	July 12, 1982	Apr. 16, 1984
Michael I. Goldberg	Mar. 18, 1944	Nov. 28, 1982	Sept. 17, 1984
John L. Decker	June 27, 1921	Aug. 1, 1983	
Philip S. Chen, Jr.	July 3, 1932	July 28, 1983	
Craig K. Wallace	Dec. 4, 1928	Jan. 19, 1984	
Itzhak Jacoby (Acting)	.....	Apr. 17, 1984	

Administrators of the Federal Security Agency

Name	*Dates of office*
Paul V. McNutt	1939–45
Watson B. Miller	1945–47
Oscar R. Ewing	1947–53
Oveta Culp Hobby	January 1953–April 1953 [1]

[1] The Department of Health, Education, and Welfare was established by act of Congress on Apr. 11, 1953.

Secretaries of the Department of Health and Human Services*

Name	*Dates of office*	
Oveta Culp Hobby	Apr. 11, 1953—	July 31, 1955
Marion B. Folsom	Aug. 1, 1955—	July 31, 1958
Arthur S. Flemming	Aug. 1, 1958—	Jan. 19, 1961
Abraham A. Ribicoff	Jan. 20, 1961—	July 13, 1962
Anthony J. Celebrezze	July 31, 1962—	Aug. 17, 1965
John W. Gardner	Aug. 18, 1965—	Feb. 29, 1968
Wilbur J. Cohen	May 9, 1968—	Jan. 19, 1969
Robert H. Finch	Jan. 22, 1969—	June 24, 1970
Elliot L. Richardson	June 24, 1970—	Jan. 20, 1973
Caspar W. Weinberger	Feb. 12, 1973—	Aug. 10, 1975
David Mathews	Aug. 8, 1975—	Jan. 20, 1977
Joseph A. Califano, Jr	Jan. 26, 1977—	July 19, 1979
Patricia Roberts Harris	July 27, 1979—	Jan. 19, 1981
Richard S. Schweiker	Jan. 22, 1981	Feb. 3, 1983
Margaret M. Heckler	Mar. 9, 1983	.....

*Name changed from Department of Health, Education, and Welfare on May 14, 1980; separate Department of Education formed.

DHHS Assistant Secretaries for Health*

Name	*Dates of office*
Philip R. Lee	Nov. 2, 1965–Feb. 16, 1969
Roger O. Egeberg	July 14, 1969–June 30, 1971
Merlin K. DuVal	July 1, 1971–Dec. 15, 1972
Charles C. Edwards	April. 18, 1973–Jan. 21, 1975
Theodore Cooper	July 1, 1975–Jan. 20, 1977
Julius B. Richmond	July 13, 1977–Jan. 20, 1981
Edward N. Brandt, Jr.	May 14, 1981–

*Title of office was changed from Assistant Secretary for Health and Scientific Affairs, November 1972.

Surgeons General of the Public Health Service

Name	*Date of birth*	*Dates of office*	
John Maynard Woodworth	Aug. 15, 1837	April 1871—	Mar. 14, 1879 [1]
John B. Hamilton	Dec. 1, 1847	Apr. 3, 1879—	May 31, 1891 [2]
Walter Wyman	Aug. 17, 1848	June 1, 1891—	Nov. 21, 1911 [3]
Rupert Blue	May 30, 1867	Jan. 13, 1912—	Mar. 1, 1920 [4]
Hugh Smith Cumming	Aug. 17, 1869	Mar. 3, 1920—	Jan. 31, 1936 [5]
Thomas Parran	Sept. 28, 1892	Apr. 6, 1936—	Apr. 5, 1948
Leonard A. Scheele	July 25, 1907	Apr. 6, 1948—	Aug. 2, 1956
Leroy E. Burney	Dec. 31, 1906	Aug. 8, 1956—	Jan. 29, 1961
Luther L. Terry	Sept. 15, 1911	Mar. 24, 1961—	Oct. 1, 1965
William H. Stewart	May 19, 1921	Oct. 2, 1965—	Aug. 1, 1969
Jesse L. Steinfeld	Jan. 6, 1927	Dec. 18, 1969—	Jan. 20, 1973
Julius B. Richmond	Sept. 16, 1916	July 13, 1977—	Jan. 20, 1981
C. Everett Koop	Oct. 14, 1916	Nov. 16, 1981—	.....

[1] Served as Supervising Surgeon of the Marine Hospital Service until Mar. 3, 1875, when his title was changed to Supervising Surgeon General.

[2] Surgeon General, Marine Hospital Service.

[3] Surgeon General, Marine Hospital Service, and Surgeon General, Public Health and Marine Hospital Service (after July 1, 1902).

[4] Surgeon General, Public Health and Marine Hospital Service, and Surgeon General, Public Health Service (after Aug. 14, 1912).

[5] Surgeon General, Public Health Service.

Part 2

The Organization

Office of the Director

The Director of NIH gives overall leadership to NIH activities and maintains close liaison with the DHHS Assistant Secretary for Health in matters relating to medical research, research training, health professions education and training, manpower resources, and biomedical communications.

He also maintains close communications with other constituents of DHHS in order to provide more effective program relationships.

To fulfill these responsibilities and obligations, the Director is assisted by a professional executive and administrative staff.

A Deputy Director shares in the overall direction of the activities of the National Institutes of Health.

A Deputy Director for Intramural Research deals with the scientific policy problems of the research Institutes and Divisions and represents them in the overall policy councils of NIH. He is aided by an Associate Director for Intramural Affairs, in maintaining overall direction of all intramural research, and an Assistant Director for Intramural Planning.

A Deputy Director for Extramural Research and Training directs the development and coordination of NIH policies and procedures for awarding funds in support of medical research and provides policy guidance for the Division of Research Grants, which administers and processes grant applications.

An Associate Director for Medical Applications of Research supervises medical technology assessment and transfer from the laboratory to the clinical setting. The main vehicle for this assessment is the Consensus Development Conference.

An Associate Director for Clinical Care is the principal adviser to the Director on matters and policies pertaining to clinical research conducted or supported by NIH.

An Associate Director for Research Services is responsible for the management of technical and selected administrative services to all NIH components and provides national leadership in research safety policy and methodology. Three primary units function under the Associate Director—the Division of Administrative Services, the Division of Engineering Services, and the Division of Safety.

An Associate Director for Program Planning and Evaluation assesses the growth of medical research nationally and applies these findings to future program planning; evaluating external factors and trends affecting NIH activities, and evaluating legislative development relevant to NIH programs and policies. The Associate Director functions through two principal units—the Division of Program Analysis and the Division of Legislative Analysis.

An Associate Director for Administration directs NIH management procedures and activities; advises on, develops and implements policies, procedures and methods for budget, contracts and grants management, financial analysis, accounting, auditing, and personnel management functions. The ADA functions through five principal units—the Division of Financial Management, Division of Management Policy, Division of Management Survey and Review, Division of Personnel Management, and the Division of Contracts and Grants.

An Associate Director for Communications is principal policy adviser on communications activities, including scientific and public information. He is also responsible for overall direction, planning, and coordination of NIH information activities, and directs information liaison with DHHS and constituent agencies.

An Associate Director for International Research provides a central coordinating and integrating function for the international aspects of NIH biomedical and behavioral research, and advises the Director on the development of international policies and procedures related to health.

National Cancer Institute

Mission

Coordinates the National Cancer Program, encompassing programs of the National Cancer Institute and cancer research in other NIH Institutes and other Federal and non-Federal programs, with the advice of the National Cancer Advisory Board.

Conducts and sponsors research relating to the cause, prevention, diagnosis, and treatment of cancer. Also conducts, chiefly by cooperative agreements, contracts, and grants, a program in cancer control that includes prevention; detection and diagnosis; therapy and rehabilitation; and education and training.

Makes grants-in-aid to universities, hospitals, laboratories, and other public or private institutions for research, and to groups of community physicians. Supports professional education in cancer research, including clinical cancer research, through individual research fellowships and research fellowships project grants.

Cooperates and collaborates with voluntary organizations and other institutions, industries, and societies engaged in cancer education activities.

Collects and makes available information on cancer. Develops an international cancer research data bank to collect, catalog, store, and disseminate the results of cancer research undertaken in any country for the use of any person in cancer research worldwide.

Important Events in NCI History

August 5, 1937—President Franklin D. Roosevelt signed the National Cancer Institute Act.

November 9, 1937—The National Advisory Cancer Council held its first meeting.

November 27, 1937—The Surgeon General awarded first grants-in-aid on the recommendation of the National Advisory Cancer Council.

January 3, 1938—The National Advisory Cancer Council recommended approval of first awards for fellowships in cancer research.

January 13, 1938—Dr. Carl Voegtlin was appointed the first Director of the Institute.

March 28, 1938—Congress passed a resolution authorizing the President of the United States to issue annually a proclamation setting apart the month of April of each year as Cancer Control Month.

October 6, 1938—The National Advisory Cancer Council recommended approval of the first radium loan.

August 1940—The *Journal of the National Cancer Institute* published its first issue.

October 31, 1940—President Franklin D. Roosevelt dedicated Building 6, the first NCI location in Bethesda.

July 1, 1946—The cancer control program was established with appropriations to the states for support of cancer control activities. Staff was organized into six sections: biology, biochemistry, biophysics, chemotherapy, epidemiology, and pathology.

July 1, 1947—NCI reorganized to provide an expanded program of intramural cancer research, cancer research grants, and cancer control activities.

November 13, 1947—The Research Grants and Fellowship Branch was established. It became the administrative arm of the Advisory Council.

October 1948—A grants program to medical, dental, and osteopathic schools was initiated for improvement of training in the field of cancer research, diagnosis, and treatment.

July 2, 1953—NCI inaugurated a full-scale clinical research program in the new Clinical Center.

April 1955—The Cancer Chemotherapy National Service Center was established in the Institute to coordinate the first national, voluntary, cooperative cancer chemotherapy program.

1957—The first malignancy (choriocarcinoma) was cured with chemotherapy at NCI.

November 1959—The *Journal of the National Cancer Institute* inaugurated a series of occasional publications as *Monographs* to be used for longer scientific communications.

September 13, 1960—The Director of NCI appointed an associate director for grants and training, associate director for field studies, and associate director for collaborative research.

January 12, 1961—The Laboratory of Viral Oncology was established to investigate the relationship of viruses to human cancer.

March 28, 1961—The Director of NCI appointed an associate director for program with responsibility for analysis and planning, and a director of intramural research.

April 21, 1961—The President's Conference on Heart Disease and Cancer was held.

April 2, 1962—An exhibit, "Man Against Cancer," opened in Washington, D.C., to commemorate the 25th anniversary of the Institute and inaugurate Cancer Progress Year.

May 7, 1962—The Acute Leukemia Task Force held its first meeting. It focused the combined efforts and resources of scientists on studies of therapy of the acute leukemia patient, and was the forerunner of other task forces on specific forms of cancer.

October 25, 1962—The Human Cancer Virus Task Force held its first meeting. The task force, of scientists from NCI and other institutions, stimulated the development of special programs in viral oncology.

1963—Studies were initiated at NCI in Hodgkin's disease with combination chemotherapy.

April 28, 1964—The area under supervision of the associate director for viral oncology was reorganized, and the Laboratory of Viral Carcinogenesis was established.

June 16, 1964—The Immunology Branch was established as a focal point for an expanding program of research on immunology.

December 1964—The report of the President's Commission on Heart Disease, Cancer, and Stroke was published.

October 1965—The Metabolism Branch was established for an expanding program of research on the metabolic aspects of cancer.

January 11, 1966—NCI reorganized to coordinate related activities. Areas of three scientific directors were established: etiology, chemotherapy, and a group of discipline-oriented laboratories and branches referred to as general laboratories and clinics. Two associate directors were named for program and for extramural activities.

February 13, 1967—A Cancer Research Center was established by the Institute in Baltimore USPHS Hospital to conduct an integrated program of laboratory and clinical research.

April 27, 1970—At the request of Senator Ralph W. Yarborough, chairman of the Committee on Labor and Public Welfare, the Senate approved the establishment of the National Panel of Consultants on the Conquest of Cancer.

November 25, 1970—The National Panel of Consultants submitted to the Senate committee a report entitled "National Program for the Conquest of Cancer."

October 18, 1971—President Nixon converted the Army's former biological warfare facilities at Fort Detrick, Md., to house research activities on the causes, treatment and prevention of cancer.

December 23, 1971—President Nixon signed the National Cancer Act of 1971.

June 30, 1972—A team of five U.S. cancer scientists met with Russian scientists in Moscow to exchange information on cancer drugs. Dr. C. Gordon Zubrod, scientific director for chemotherapy, NCI, on behalf of the United States, signed a U.S.-U.S.S.R. agreement for continued cooperation on the exchange of drugs, visiting scientists, and information.

July 27, 1972—A Bureau-level organization was established for the National Cancer Institute, giving the Institute and its components organizational status commensurate with the responsibilities bestowed on it by the National Cancer Act of 1971. Under the reorganization, the Institute was composed of the Office of the Director and four divisions: the Division of Cancer Biology and Diagnosis, Division of Cancer Cause and Prevention, Division of Cancer Treatment, and Division of Cancer Grants (remamed successively the Division of Cancer Research, Resources and Centers, and later the Division of Extramural Activities).

June 20, 1973—NCI Director Dr. Frank J. Rauscher, Jr., announced that eight institutions were recognized as Comprehensive Cancer Centers to bring results of research as rapidly as possible to a maximum number of people. Additional centers were announced on Nov. 2, 1973, June 13, 1974, Oct. 18, 1974, Apr. 8, 1976, Dec. 30, 1976, July 27, 1978, and Mar. 2, 1979. The current total is 20 (see table).

September 5, 1973—The President transmitted to Congress the first annual report of the Director of the National Cancer Program, a 5-year strategic plan for the program, and the report of the National Cancer Advisory Board. Preparation and transmittal of the documents were mandated by the National Cancer Act of 1971.

March 1, 1974—Negotiations were concluded for relocating the National Cancer Institute's Baltimore Cancer Research Center

NCI Comprehensive Cancer Centers

Comprehensive Cancer Center, University of Alabama, Birmingham
Kenneth Norris, Jr., Cancer Research Institute, University of Southern California, Los Angeles
Jonsson Comprehensive Cancer Center, University of California, Los Angeles
Yale University Comprehensive Cancer Center, New Haven, Connecticut
Georgetown University/Howard University Comprehensive Cancer Center, Washington, D.C.
Comprehensive Cancer Center for the State of Florida, University of Miami Hospital and Clinics
Illinois Cancer Council, Northwestern University Cancer Center, Chicago, and University of Chicago Cancer Research Center
Johns Hopkins Oncology Center, Baltimore, Maryland
Dana-Farber Cancer Institute, Boston
Comprehensive Cancer Center of Metropolitan Detroit
Mayo Comprehensive Cancer Center, Rochester, Minnesota
Memorial Sloan-Kettering Cancer Center, New York City
Roswell Park Memorial Institute, Buffalo, New York
Columbia University Cancer Center, College of Physicians & Surgeons, New York City
Comprehensive Cancer Center, Duke University Medical Center, Durham, North Carolina
Ohio State University Comprehensive Cancer Center, Columbus
Fox Chase/University of Pennsylvania Comprehensive Cancer Center, Philadelphia
University of Texas System Cancer Center, M.D. Anderson Hospital & Tumor Institute, Houston
Fred Hutchinson Cancer Research Center, Seattle
University of Wisconsin Clinical Cancer Center, Madison

in the University of Maryland Hospital complex in Baltimore.

September 10, 1974—The Division of Cancer Control and Rehabilitation was established to plan, direct, and coordinate an integrated program of cancer control and rehabilitation activities with the goal of identifying, testing, evaluating, demonstrating, communicating, and promoting the widespread use of available and new methods for reducing cancer incidence, morbidity, and mortality.

September 12, 1974—NCI made its first cancer control awards to state health departments for a 3-year program to screen low-income women for cancer of the uterine cervix. At its peak in 1978, the program had grown to a total of 32 states and territories.

December 17, 1974—NCI and the National Library of Medicine established CANCERLINE, a jointly developed computerized service to provide scientists across the country with information on cancer research projects and published findings.

December 19, 1974—The Clinical Cancer Education Program was announced to develop more innovative teaching methods in cancer prevention, diagnosis, treatment, and rehabilitation in schools of medicine, dentistry, osteopathy, and public health; affiliated teaching hospitals; and specialized cancer institutions.

1975—The Cooperative Minority Biomedical Program, as approved by the National Cancer Advisory Board, represented a cofunding effort by NCI to implement and foster cancer research through the Minority Biomedical Research Support Program of the Division of Research Resources and the Minority Access to Research Careers Program sponsored by the National Institute of General Medical Sciences.

July 1975—The Division of Cancer Treatment was expanded to include the NCI Surgery and Radiation Oncology Branches and the extramural program of Cancer Cooperative Clinical Trials. The reorganization strengthened the Division's capabilities for conducting a national program of research on cancer treatment by combined modalities.

August 5, 1977—NCI celebrated its 40th anniversary with a commemorative ceremony on the NIH campus. Senator Warren G. Magnuson of Washington who, as a member of the House of Representatives, introduced a bill to establish the NCI in 1937, sent a message stating: "Those one and a half million Americans who are alive today—cured of cancer—are ample justification for all that we've appropriated over the last 40 years."

May 15, 1978—The first phase of an extensive NCI reorganization was announced. Day-by-day administrative and funding responsibility for extramural research was consolidated in each of the four divisions. Responsibility for grant and contract review committees and for other committee management activities was transferred to the Division of Cancer Research Resources and Centers (formerly cancer grants).

1979—The first human RNA virus (HTLV-I) was discovered by NCI's Dr. Robert Gallo.

July 10, 1980—HHS Secretary Patricia Roberts Harris approved Institute-wide reorganization. A newly created Division of Resources, Centers, and Community Activities incorporated functions of the former Division of Cancer Control and Rehabilitation and programs for education, training, construction, cancer centers, and organ site research of the former Division of Cancer Research, Resources, and Centers (DCRRC). Other activities of the DCRRC were incorporated into the new Division of Extramural Activities.

April 27, 1981—A new Biological Response Modifiers Program was established in the Division of Cancer Treatment to investigate, develop and bring to clinical trials potential therapeutic agents that may alter biological responses that are important in the biology of cancer growth and metastasis.

June 10, 1981—The NIH Director approved the establishment of a Low-Level Radiation Effects Branch in the Office of the Director, NCI, to coordinate study activities on the biological effects of low levels of ionizing radiation. This branch moved to the Division of Cancer Treatment in October 1981.

July 1, 1981—NCI began the conversion of the Baltimore Cancer Research Program from an intramural part of the Division of Cancer Treatment to an extramural cancer research center at the University of Maryland.

July 13, 1981—The Division of Cancer Cause and Prevention increased its focus on research in chemically induced cancer and the emphasis on molecular events of tumor initiation and promotion. An assistant division director for chemical carcinogenesis was appointed and four new laboratories were created.

May 17, 1982—A new Radiation Research Program was established in the Division of Cancer Treatment to coordinate radiation-related research in the areas of biological effects, diagnosis and treatment. The existing Low-Level Radiation Effects Branch, Diagnostic Imaging Research Branch, and Radiotherapy Development Branch were thus consolidated.

September 1982—PDQ1, a computerized data base on cancer treatment information, became

available nationwide via the National Library of Medicine's MEDLARS system.

December 16, 1982—NCI purchased what is now the R. A. Bloch International Cancer Information Center through generous donations to the NCI Gift Fund. This building houses the *Journal of the National Cancer Institute;* the Scientific Information Branch, which publishes *Cancer Treatment Reports* and *Cancer Treatment Symposia;* the International Cancer Research Data Bank; and PDQ, a new computerized data base for physicians treating cancer patients. These publications and services improve and speed communications between scientists, and between cancer research laboratories and the physicians who treat cancer patients.

January 1983—The Management Information Systems Branch was established in the Office of Program Planning and Analysis to coordinate the Institute's automated administrative and management information systems. The Program Analysis and Formulation Branch was abolished.

Early 1983—A new Prevention Program was established in the Division of Resources, Centers and Community Activities to initiate prevention research in the areas of diet, chemoprevention, early detection, and identification of high-risk groups in the occupational setting. Branches in this program include: Diet and Cancer, Chemoprevention, Cancer Prevention Studies, Cancer Detection, and Occupational Cancer.

July 16, 1983—NCI launched the Community Clinical Oncology Program (CCOP) to establish a cancer control effort which combines the expertise of community oncologists and the NCI clinical research programs. The CCOP initiative is designed to bring the advantages of clinical research to cancer patients in their own communities. Sixty-two CCOP's were funded in FY 1983.

July 20, 1983—The Surveillance, Epidemiology, and End Results (SEER) Program and most of the Biometry Branch of the Division of Cancer Cause and Prevention were transferred to the Division of Resources, Centers and Community Activities (DRCCA). The transfer provided DRCCA with biometric and epidemiologic support to monitor cancer incidence and survival and to assess the National Cancer Program's success in preventing cancer and improving survival.

September 1983—The Office of International Affairs was reorganized to add a Scientific Information Branch and a Computer Communications Branch. The Scientific Information Branch is composed of a Literature Research Section, Cancer Treatment Reports Section, Journal of the National Cancer Institute Section, and the International Cancer Research Data Bank Section.

December 5, 1983—The name of the Division of Cancer Cause and Prevention was changed to the Division of Cancer Etiology (DCE).

The name of the Division of Resources, Centers and Community Activities was changed to the Division of Cancer Prevention and Control (DCPC) to emphasize the Division's roles in cancer prevention and control research.

1984—The International Cancer Information Center was created within the Office of International Affairs. It includes the preexisting Scientific Information Branch and Computer Communications Branch. The International Cancer Research Data Bank was changed from a section of the Scientific Information Branch to a third branch.

A policy statement regarding the relationship of the NCI, the pharmaceutical industry, and NCI-supported cooperative groups was developed. The statement articulates the need for collaboration between the NCI and the pharmaceutical industry in pursuing the joint development of anticancer drugs of mutual interest. It also sets forth guidelines for the handling of issues such as the joint sponsorship of trials, the sharing of information between sponsors, maintaining the confidentiality of certain classes of data, the funding of cooperative groups by drug companies, the review of protocols and the publication of results.

The Comprehensive Minority Biomedical Program, DEA, was established to broaden the focus of the minority effort along lines of the programmatic thrusts of the Institute, thereby giving it trans-NCI responsibilities.

February 1, 1984—The Radiation Studies Section of the Environmental Epidemiology Branch of DCE was upgraded to branch status and named the Radiation Epidemiology Branch.

March 6, 1984—DHHS Secretary Margaret M. Heckler launched a new cancer prevention campaign by NCI.

April 1984—An NCI scientist, Dr. Robert Gallo, Jr., reported the isolation of a new group of viruses which are distantly related to human T-cell leukemia/lymphoma virus (HTLV). The new viruses, named HTLV-III, were isolated from the helper T-cells of patients with AIDS or pre-AIDS symptoms, as well as from healthy individuals at high risk for developing AIDS. Essentially all AIDS patients have detectable high levels of antibody to the virus. Patients exhibiting pre-AIDS symptoms such as the lymphadenopathy syndrome have

generally been exposed to the virus and also have antibody. Individuals who are not at high risk for developing AIDS normally have no antibody levels. This discovery will make the control of blood-product-transmitted AIDS feasible by enabling the development of a simple test for the detection of AIDS-infected blood by blood banks and diagnostic laboratories as well as the development of an AIDS vaccine.

June 1, 1984—The Low Level Radiation Effects Branch was transferred from the Division of Cancer Treatment to DCE. This is an extramural branch that administers grants and contracts supporting the study of the biological effects of low-level radiation and the molecular mechanisms involved in producing and repairing radiation-induced DNA lesions.

July 31, 1984—The Secretary, DHHS, approved the reorganization of the Division of Cancer Etiology into three program areas: the Biological Carcinogenesis Program, the Chemical and Physical Carcinogenesis Program and the Epidemiology and Biostatistics Program. This reorganization merges the intramural programs with the extramural programs in the three areas, each to be headed by an associate director.

October 1, 1984—A new intramural laboratory, the Laboratory of Tumor Virus Biology, was established within the Biological Carcinogenesis Program, DCE. Its mission is to study the molecular biology and gene regulation of papillomaviruses and the mechanism of papillomavirus-induced cellular transformation and tumor progression.

NCI Legislative Chronology

February 4, 1927—Senator M. M. Neely, West Virginia, introduced S. 5589, "To authorize a reward for the discovery of a successful cure for cancer, and to create a commission to inquire into and ascertain the success of such cure." The reward was to be $5 million.

March 7, 1928—Senator M. M. Neely introduced S. 3554, "To authorize the National Academy of Sciences to investigate the means and methods for affording Federal aid in discovering a cure for cancer and for other purposes."

April 23, 1929—Senator W. J. Harris, Georgia, introduced S. 466, "To authorize the Public Health Service and the National Academy of Sciences jointly to investigate the means and methods for affording Federal aid in discovering a cure for cancer and for other purposes."

May 29, 1929—Senator W. J. Harris introduced S. 4531, authorizing a survey in connection with the control of cancer and providing "That the Surgeon General of the Public Health Service is authorized and directed to make a general survey in connection with the control of cancer and submit a report thereon to the Congress as soon as practicable, together with his recommendations for necessary Federal legislation."

April 2, 1937—Senator Homer T. Bone of Washington introduced S. 2067, "Authorizing the Surgeon General of the Public Health Service to control and prevent the spread of the disease of cancer." It authorized an annual appropriation of $1 million.

April 12, 1937—Congressman Warren G. Magnuson of Washington introduced H.R. 6100, an identical bill to S. 2067.

April 29, 1937—Congressman Maury Maverick of Texas introduced H.R. 6767, "To promote research in the cause, prevention, and methods of diagnosis and treatment of cancer, to provide better facilities for the diagnosis and treatment of cancer, to establish a National Cancer Center in the Public Health Service, and for other purposes." It authorized an appropriation of $2,400,000 for the first year and $1 million annually thereafter. The legal office of PHS had helped draft the bill on the basis of suggestions made by Dr. Dudley Jackson of San Antonio, Tex.

July 8, 1937—A joint hearing of the Senate and House committees was conducted before a Subcommittee on Cancer Research, and a revised bill was written.

July 23, 1937—The National Cancer Institute Act was passed by Congress.

August 5, 1937—The National Cancer Institute Act, P.L. 244, 75th Congress, was signed by President Franklin D. Roosevelt, "To provide for, foster, and aid in coordinating research relating to cancer; to establish the National Cancer Institute; and for other purposes." An appropriation of $700,000 for each fiscal year was authorized.

March 28, 1938—House Joint Resolution 468, 75th Congress, was passed, "To dedicate the month of April in each year to a voluntary national program for the control of cancer."

July 1, 1944—The Public Health Service Act, P.L. 410, 78th Congress, provided that "The National Cancer Institute shall be a division in the National Institutes of Health." The act also revised and consolidated many revisions into a single law. The limit of $700,000 annual appropriation was removed.

August 15, 1950—Public Law 692, 81st Congress, increased the term of office of National Advisory Cancer Council members from 3 to 4 years and the size of the Council from 6 to 12 members, exclusive of the ex officio members.

December 23, 1971—President Nixon signed P.L. 92-218. The National Cancer Act of 1971, providing increased authorities and responsibilities for the NCI Director; initiating a National Cancer Program; establishing a 3-member President's Cancer Panel and a 23-member National Cancer Advisory Board, the latter replacing the National Advisory Cancer Council; authorizing the establishment of 15 new research, training, and demonstration cancer centers; establishing cancer control programs as necessary for cooperation with state and other health agencies in the diagnosis, prevention, and treatment of cancer; and providing for the collection, analysis, and dissemination of all data useful in the diagnosis, prevention, and treatment of cancer, including the establishment of an international cancer data research bank.

July 23, 1974—The National Cancer Act Amendments of 1974 (P.L. 93-352) was signed by the President to improve the National Cancer Program and to authorize appropriations for the next three fiscal years. P.L. 93-352 also included provisions for disseminating information on nutrition as related to the therapy or causation of cancer, for trials of cytology test programs for the diagnosis of uterine cancer, and for peer review of grant applications and contract projects. It also established a President's Biomedical Research Panel.

August 1, 1977—The NCI mandate was extended for 1 year when the President signed the Health Planning and Health Services Research and Statistics Extension Act (P.L. 95-83).

November 9, 1978—The President signed the Community Mental Health Centers Act (P.L. 95-622) amending the National Cancer Act to emphasize education and demonstration programs in cancer treatment and prevention, and stipulating that NCI devote more resources to prevention, focusing particularly on environmental, dietary and occupational cancer causes.

December 17, 1980—The Health Programs Extension Act of 1980 (P.L. 96-538) was signed into law, extending NCI authorization for 3 years.

Biographical Sketches of NCI Directors

Carl Voegtlin, Ph. D.
Dr. Voegtlin, the Institute's first Director, was born in Zofingen, Switzerland, on July 28, 1879. He studied at the University of Basel, University of Munich, University of Geneva, and received a Ph. D. degree in 1904 from the University of Freiburg.

Upon arriving in the United States in 1905, he became a chemistry instructor at the University of Wisconsin, and the following year went to Johns Hopkins where he remained until 1913. As professor of pharmacology and chief of the Division of Pharmacy at the Hygienic Laboratory, his cancer research was largely confined to the biochemical aspects.

During World War II and for several years thereafter he was lecturer in pharmacology at the University of Rochester, which conferred upon him an honorary degree of doctor of science for his contributions to war and other research efforts.

Dr. Voegtlin became Director of NCI on Jan. 13, 1938, and held this post until his retirement from PHS on July 31, 1943. He retained an active interest in NCI until his death in 1960.

Roscoe Roy Spencer, M.D.
Dr. Spencer was born in King William County, Va., July 28, 1888, and received his M.D. degree from Johns Hopkins in 1913. Before becoming NCI's first assistant chief, he was noted for his contribution in the investigations of Rocky Mountain spotted fever.

He became Director of NCI on August 1, 1943, and remained in this post until July 1, 1947. He had assignments with PHS until his retirement in 1952. He died in 1982 in Lynchburg, Va.

Leonard Andrew Scheele, M.D.
Dr. Scheele was born in Fort Wayne, Ind., July 25, 1907. He received an A.B. degree from University of Michigan and his M.D. degree from Wayne State University.

Upon entering PHS, he served as assistant quarantine officer, health officer, special cancer fellow at Memorial Hospital in New York City, officer-in-charge of the National Cancer Control Program, and chief of Medical Division of Civilian Defense before becoming assistant chief of NCI in 1946.

Dr. Scheele served as Director of NCI from July 1, 1947, to April 6, 1948, when he was appointed Surgeon General, PHS. Upon retirement from PHS in 1956, he became the president of Warner-Chilcott Laboratories, Warner-Lambert Pharmaceutical Co. He is now retired.

John Roderick Heller, M.D.
Dr. Heller was born in Fair Play, S.C., on February 27, 1905, and received his M.D. degree from Emory University, Atlanta, Ga. He was commissioned in PHS in 1934, and became chief of PHS's Venereal Disease Division before becoming Director of NCI on May 15, 1948, a post which he held until July 1, 1960. He then joined the Memorial Sloan-Kettering Cancer Center in New York City as president and chief executive officer, remaining in that position until February 1964.

Subsequently he served as vice chairman of the board of trustees of the center and was special

consultant on international, medical and scientific affairs to the American Cancer Society.

On August 1, 1965, Dr. Heller returned to NCI as special consultant on international activities and remained in that position until he retired in 1981.

Kenneth Milo Endicott, M.D.
Dr. Endicott was born in Canon City, Colo., June 6, 1916, and received his M.D. degree from the University of Colorado in 1939.

He entered PHS in 1940, and served in the Division of Pathology and as scientific director, Division of Research Grants, NIH, before being appointed chief of the Cancer Chemotherapy National Service Center in 1955. In 1958 he was appointed Associate Director, NIH, and served in this capacity until appointed Director of NCI on July 1, 1960.

On November 10, 1969, he became Director of the Bureau of Health Professions Education and Manpower Training. On August 3, 1973, he was named Administrator for the Health Resources Administration.

Dr. Endicott retired from the Federal service in 1977 and now holds a position with a private professional association.

Carl Gwin Baker, M.D.
Dr. Baker was born in Louisville, Ky., November 27, 1920, and received his M.D. degree from the University of Louisville in 1944 and his M.A. degree in biochemistry from the University of California at Berkeley in 1949. He served as a medical officer in the U.S. Navy, 1945–1946.

He entered the PHS in 1949 and served in the Laboratory of Biochemistry, the Research Grants Branch, and the Office of the Director, NCI, until 1958 when he was appointed assistant director, NCI. During 1957–1958 he was assistant to the Associate Director for Intramural Research, NIH. He became associate director for program, NCI, in 1961 after serving as acting scientific director for intramural research. He was named scientific director for etiology, NCI, in 1967. He became Acting Director, November 10, 1969, and was appointed Director, July 13, 1970.

On May 5, 1972, Dr. Baker was named Special Assistant to the Director, NIH, with responsibility to plan and establish a new Office of Technology Implementation. Following his retirement from the Public Health Service on September 1, 1972, he became president of Hazleton Laboratories, Inc., of Falls Church, Va., later serving as a consultant in private industry. He is now director of a private cancer research foundation.

Frank Joseph Rauscher, Jr., Ph. D.
Dr. Rauscher was born in Hellertown, Pa., May 24, 1931. He received his Ph. D. degree in microbiology from Rutgers University in 1957. He also held several research and teaching positions at Rutgers from 1955 to 1959.

In 1959 he joined the NCI Laboratory of Viral Oncology, holding that post until 1964. From 1964 to 1966 he served as head of the Viral Oncology Section, Laboratory of Viral Oncology, NCI. Also, from 1964 to 1970 he was chairman of the Special Virus Leukemia (later Cancer) Program, etiology, NCI. From 1965 to 1967 he was acting chief and later chief, Viral Leukemia and Lymphoma Branch, etiology, NCI.

Dr. Rauscher served as associate scientific director for viral oncology, etiology, NCI, from 1967 to 1970.

From 1969 to 1972 he was acting scientific director, and later scientific director for etiology, NCI. On May 5, 1972, the President named him Director of the National Cancer Institute and of the National Cancer Program.

Dr. Rauscher became senior vice president for research of the American Cancer Society on November 1, 1976.

Arthur Canfield Upton, M.D.
Dr. Upton was born in Ann Arbor, Mich., February 27, 1923. He received his doctor of medicine degree from the University of Michigan in 1947 and completed his internship and residency in pathology at Michigan before joining the faculty as an instructor in pathology from 1950 to 1951.

He joined the biology division of the Oak Ridge National Laboratory in 1951 and rose to chief of the pathology-physiology section of the biology division in 1954. In 1969, he left Oak Ridge to become professor and chairman of the department of pathology at the State University of New York at Stony Brook and was appointed dean of the School of Basic Health Sciences in 1970.

Dr. Upton was president of the American Association for Cancer Research during 1963–1964 and has served on numerous other national and international boards and committees. He also was president of the American Society for Experimental Pathology (1967–1968) and the Radiation Research Society (1965–1966).

He was appointed Director of NCI and the National Cancer Program by the President on July 29, 1977. He became director of New York University's Institute of Environmental Medicine on January 1, 1980.

Vincent T. DeVita, Jr., M.D.
Dr. DeVita was born in the Bronx, New York, on March 7, 1935. He received his bachelor of science degree in 1957 from the College of William and Mary. In 1961 he graduated with distinction from the George Washington University School of Medicine, where he completed his residency in 1963.

He joined NCI initially in 1963 as a clinical associate in the

Laboratory of Chemical Pharmacology, leaving in 1965 to complete his advanced training in medicine at Yale-New Haven Medical Center. He returned to NCI in 1966 and has served consecutively as a senior investigator in the Solid Tumor Service, head of the Solid Tumor Service, chief of the Medicine Branch, and director of the Division of Cancer Treatment, an appointment received in 1974. Since 1975 he has also held the post of clinical director of NCI. He served as Acting Director of NCI from January 1, 1980, until July 9, 1980, when he was appointed NCI Director.

Dr. DeVita has been associate editor of the *Journal of the National Cancer Institute, Cancer Research,* and the *American Journal of Medicine.* A past president of the American Society of Clinical Oncology, he has served on the board of directors of the American Association of Cancer Research and numerous other national and international boards, committees, and professional societies.

He has received numerous awards, among them the Albert & Mary Lasker Medical Research Award in 1972 and the Griffuel Prize for cancer research, an honor received December 4, 1980, in recognition of his significant contribution in the development of a drug therapy that dramatically lengthened the survival rate of many patients with cancer of the lymph system.

In 1982 Dr. DeVita received the James Ewing Award from the Society of Surgical Oncology and an honorary doctor of science degree from the College of William and Mary. He is coeditor of the 1982 textbook *Cancer—Principles and Practice of Oncology.*

In early 1983, he received the Alumni Achievement Award from George Washington University and was made an honorary member of the Society of Gynecologic Oncology and the Japanese Cancer Society. He was also named an honorary fellow of the American College of Radiology. In May 1983, he received the PHS Distinguished Service Medal and the Memorial Sloan-Kettering Cancer Center Award for Outstanding Support of Biomedical Science. He was awarded the honorary doctor of science degree by Ohio State University in June.

Dr. DeVita was awarded an honorary doctor of science degree by Ohio State University in 1983 and by George Washington University in 1984.

National Cancer Program Plan

In late 1971 and early 1972 NCI convened a series of 40 meetings by 250 non-Federal and Federal scientists to assist in the development of the National Cancer Program Plan (NCPP). The plan consisted of two major documents. *The Strategic Plan,* which presented an organized series of recommendations for cancer research and cancer control activities; and the *NCP Operational Plan,* which described the major policies and procedures for management and operation of the National Cancer Program and outlined the NCP's major directions for the next 5 years. The first *Strategic Plan* was transmitted by the President to the Congress in October 1973. The first edition of *NCP Operational Plan* was transmitted by the President to the Congress in November 1974.

In 1974–75 the *Strategic Plan* was updated and revised. Since then, the NCI Director has prepared each year a report summarizing activities, progress and accomplishments for the preceding year of operations and a plan, including budget projections, for the ensuing 5-year period. This document, currently entitled the *Director's Report and Annual Plan,* is prepared in accordance with the National Cancer Act for transmittal by the HHS Secretary to the President and Congress.

NCI Appropriations—Grants and Direct Operations

Fiscal year	Total grants [1]	Direct operations [2]	Total
	[Amounts in thousands of dollars]		
1950	$14,400	$4,500	$18,900
1951	15,217	4,869	20,086
1952	14,640	5,016	19,656
1953	12,220	5,667	17,887
1954	14,324	5,913	20,237
1955	15,096	6,641	21,737
1956	16,246	8,732	24,978
1957	32,672	15,760	48,432
1958	31,134	25,268	56,402
1959	39,941	35,327	75,268
1960	49,935	41,322	91,257
1961	68,183	42,817	111,000
1962	86,855	55,981	142,836
1963	89,796	65,946	155,742
1964	82,187	62,153	144,340
1965	75,282	74,729	[3] 150,011
1966	83,406	80,362	163,768
1967	92,788	82,868	175,656
1968	98,993	84,363	183,356
1969	98,546	86,603	185,149
1970	99,810	90,676	190,486
1971	109,983	123,177	233,160
1972	142,733	236,061	378,794
1973	216,642	219,363	492,205
1974	232,652	318,540	[4] 551,192
1975	337,613	354,053	691,666
1976	353,764	407,963	761,727
1977	382,876	432,124	815,000
1978	408,832	463,556	872,388
1979	454,702	482,427	937,129
1980	475,372	524,497	999,869
1981	523,481	465,874	989,355
1982	520,247	466,370	986,617
1983	572,325	415,317	987,642
1984	643,876	437,705	1,081,581

[1] Includes construction funds.
[2] Includes Cancer Control.
[3] Includes special appropriation for virus-leukemia development program.
[4] Does not reflect reduction authorized by P.L. 93-192.

Special NCI Programs

As a result of the Institute-wide reorganization approved by the HHS Secretary on July 10, 1980, NCI's divisions and programs were reoriented to reflect fundamental research programs with emphasis on applied prevention. Revision included the amalgamation of the cancer centers, the organ site, the training and education, and the construction programs with the cancer control program in the new Division of Resources, Centers,

and Community Activities, which since has been renamed the Division of Cancer Prevention and Control (DCPC). DCPC is composed of three principal areas 1) prevention, 2) centers and community oncology, and 3) cancer control science. DCPC expenditures for FY 1984 totaled $227.2 million. This included cancer control, with expenditures of $63.3 million that funded 108 contracts and 253 grants in 49 states, the District of Columbia, and Puerto Rico; $79 million for cancer centers, and $33.7 million for resource manpower development programs.

Examples of specific program areas based in DCPC are noted below.

A new chemoprevention research program was begun in FY 1982 to determine whether selected micronutrients or synthetic compounds could reduce cancer incidence in human clinical trials. In 1984 preclinical studies of efficacy and toxicology were added and several clinical trials in chemoprevention and diet and nutrition were begun.

The cancer control science research program identifies and evaluates cancer control interventions. The program includes the development of tracking and monitoring systems, career development, education and training programs related to cancer control; and the support of research on cancer control applications and the related area of health promotion.

The Smoking, Tobacco and Cancer Program has launched a major research initiative to combat smoking. The topic areas stress intervention research on strategies involving the media, schools, self-help, physicians and dentists, and target populations such as heavy smokers, minorities, youth and smokeless tobacco users.

Cancer centers serve as lead organizations in cancer research based on a multidisciplinary approach. Centers also develop broad programs which include scientists and physicians from many fields. Cancer centers are a national resource and provide a critical core of: 1) highly trained laboratory and clinical research personnel, 2) physical facilities and equipment, and 3) administrative support.

Centers facilitate research on cancer and accelerate transfer of new information about cancer prevention, diagnosis, treatment, rehabilitation, and continuing care to health professionals in their surrounding communities and to the general public. NCI currently supports 39 centers in both laboratory and clinical investigation and 16 laboratory science centers. Twenty of these have met the criteria required for recognition as Comprehensive Cancer Centers. In addition to clinical and basic science research, Comprehensive Cancer Centers undertake a wide spectrum of cancer activities: epidemiology and evaluation, training and education, community outreach, and other programs in cancer control.

The Community Clinical Oncology Program (CCOP), a major NCI research initiative begun in 1983, involves community physicians in clinical trials through participation in NCI-approved research protocols as the first step in other future cancer control activities. CCOP's affiliate with major medical centers, and national and regional cooperative groups. Research therapies used are designed to answer specific questions in an orderly fashion to improve the treatment of cancer patients. The program, as a cooperative venture among scientists at NCI, research centers, and community oncologists, is a key ingredient in the national effort to reduce patient morbidity and mortality. In addition, the program will provide new information on patterns of patient care and information about the dissemination of new technology.

Organ-site projects led by outstanding scientists from institutions throughout the country were organized by NCI in the past decade to identify areas for coordinated research, and to support targeted research using epidemiological, laboratory and clinical methods. Five programs deal with breast, bladder, large bowel, pancreas and prostate cancers.

A single Organ Systems Coordinating Center was competitively awarded in 1984. It coordinates the efforts of five working groups responsible for planning, coordinating, monitoring, and evaluating the epidemiologic, laboratory, and clinical research components of these programs.

NCI, in consultation with the National Institute on Aging supports research on the older cancer patient and designed to investigate problems unique to the elderly patient with cancer. Multidisciplinary research will be conducted by specialists in oncology, geriatrics, gerontology, and other relevant disciplines and professions to reduce the knowledge gap about how old age affects cancer patient management.

Biochemical and Molecular Epidemiology

The Division of Cancer Etiology (formerly Division of Cancer Cause and Prevention) launched a multidisciplinary program that combines traditional epidemiologic approaches with new laboratory techniques to evaluate the influence of oncogenic viruses, dietary and metabolic factors, host susceptibility, air and water pollutants and a wide variety of other risk factors. These risk factors were likely to have escaped detection until new laboratory probes were integrated with epidemiologic investigations.

AIDS and Kaposi's Sarcoma

As a result of concern about the threat to human health of acquired immune deficiency syndrome (AIDS), NCI has funded a broad range of studies to determine the cause of AIDS, to identify markers for the disorder, and to treat Kaposi's sarcoma, a cancer that some AIDS patients develop. These studies include virologic, immunologic, epidemiologic, genetic, and thereapeutic investigations. A number of cooperative agreements including 11 awards in FY 1984 have been funded from responses to "requests for applications" announced jointly with the National Institute of Allergy and Infectious Diseases to stimulate research on the disorder including attempts to isolate, identify and characterize the biological agent in AIDS and Kaposi's sarcoma. Determination of etiology has made possible the development of appropriate methods for eventual prevention and/or control of the disease.

In March 1983 and NCI AIDS Task Force was established to find the causative agent for the disease. In 1984 it was announced that this mission was accomplished when NCI workers identified and characterized a putative etiologic agent, the HTLV-III virus.

In June 1984 five private firms were selected to develop and distribute a blood test for antibody to HTLV-III. Nonexclusive, royalty-bearing licenses were signed with: Abbott Laboratories; Electro-Nucleonics, Inc.; Litton-Bionetics, Inc.; Travenol/ Genentech Diagnostics; and duPont De Nemours and Co., Inc., with Biotech Research Laboratories, Inc. At the NCI Frederick Cancer Research Facility developmental research in the area of large-scale virus production has allowed a very rapid transfer of large quantities of virus to the above organizations. The HTLV-III blood test is now (April 1985) a reality and has been approved by the FDA.

In August 1984, the NCI AIDS Task Force was restructured. Work is proceeding to develop not only a screening test for the presence of this virus in blood samples but also an effective vaccine. NCI has been identified by DHHS as the lead agency for the research needed to effect primary prevention of AIDS by a safe vaccine.

A subcommittee on AIDS has cochairmen from the boards of scientific counselors of both the Division of Cancer Etiology and the Division of Cancer Treatment. It focuses on concepts, technical reviews, and feasibility of projects in the area of vaccines, animal models, drug assessment and interventive therapy.

Biological Response Modifiers

The Biological Response Modifiers (BRM) program within the Division of Cancer Treatment serves as a focus for ongoing as well as new grant, contract and intramural activities. It also performs basic, preclinical, and clinical studies of synthetic or purified agents that favorably modify a patient's biological response to cancer cells.

The intramural research program focuses on basic research studies of the immunologic, biochemical and molecular biological basis for the effects of BRM's, as well as on clinical investigations of promising BRM's. Current emphasis is on preclinical and clinical studies with cytokines (interferons, interleukins 1, 2 and 3, colony-stimulating factors, and tumor cytotoxic factors), monoclonal antibodies to tumor-associated antigens, and cell-mediated immunity (particularly natural killer cells and macrophages).

The extramural research program primarily concerns the identification and characterization of BRM's which may be useful in the therapy of patients with cancer. Potentially useful agents are evaluated extensively in appropriate preclinical test systems. BRM's with potent immunomodulatory activity and antitumor activity in murine tumor models are evaluated further in phase I and II clinical trials to determine biological response modifying effects, thereapeutic efficacy and toxicity. Current clincial trials are with interferons, interleukin 2, and monoclonal antibodies conjugated with radioisotopes or toxins.

In FY 1983, the Laboratory of Molecular Immunoregulation was established to specifically focus on biological research at the molecular level.

Biological response modifiers hold great promise for the development of new cancer therapies. The use of biologics and biological response modifiers, either alone or in combination with other modalities, is one of the areas of greatest change in cancer therapy.

Radiation Research Program

The Radiation Research Program (RRP), an extramural program of the Division of Cancer Treatment, serves as the NIH focal point for ongoing as well as new grant and contract activities in radiation research and diagnostic imaging.

Within the RRP, a variety of research activities are supported, spanning the disciplines of radiation biology, physics and therapy. Areas of high priority include particle beam radiotherapy, hyperthermia treatment and equipment development, radiation modifiers, photodynamic therapy, interstitial and intraoperative radiotherapy, and treatment planning for heavy particles and photons.

In the field of diagnostic imaging, the RRP also supports research and development of

magnetic reasonance imaging (MRI), computer aided tomography (CT), single photon emission computer tomography (SPECT), positron emission tomography (PET), as well as traditional x-ray imaging, digital radiography and nuclear medicine.

PDQ

NCI has developed a nationwide computerized information data base called PDQ. A user-friendly source of information about cancer treatment, PDQ is designed to provide physicians with information about the prognosis and accepted treatment options for specific cancers, protocols, and directories of institutions and physicians who are interested and experienced in the management of specific cancers.

The initial phase of PDQ became available on the National Library of Medicine MEDLARS system in the fall of 1982, giving physicians for the first time a geographically matrixed index to NCI-sponsored clinical trials. Designed for access via personal computers, the data base has been expanded to describe state-of-the-art treatment for specific types and stages of cancer, and detailed information on a variety of resources, including a directory of physicians and institutions that have as an interest the care of cancer patients.

A PDQ editorial board keeps PDQ accurate and up-to-date. Members include physicians with expertise in various areas of cancer treatment from outside institutions as well as some NCI physician investigators. Every month the core editorial board of 21 physicians reviews and discusses treatment advances that should be included in PDQ. Suggestions for change are reviewed by experts drawn from the 51 members of the associate editorial board.

PDQ presently is available on the computer system of the NIH National Library of Medicine's MEDLARS system at 2,000 centers across the country. Ultimately, PDQ will be available to physicians through private vendors of computer services, probably via their own regular office computers or word-processor equipment. A license agreement with a private vendor was signed in September 1984. This makes PDQ available simultaneously to thousands of physicians 22 hours a day Monday through Saturday, and 17 hours on Sunday. Other negotiations are being conducted to make PDQ even more widely available.

PDQ includes a state-of-the-art statement for each type and stage of cancer, whether standard therapy or investigational. If a standard therapy exists for a specific type of cancer, a range of treatment alternatives will be presented to the data base user. Interlinked with the state-of-the-art statements is a directory of oncologists of all disciplnes.

Frederick Cancer Research Facility

The Frederick Cancer Research Facility (FCRF) at Fort Detrick, Md., was established by NCI in 1972 under a contract with Litton Bionetics, Inc., to renovate, manage, and operate the facility. Since then, NCI has moved additional intramural laboratories to Frederick.

In September 1982 NCI awarded 5-year contracts totaling $40 million annually to five firms. One contract, to Litton Bionetics, Inc., to continue basic research, amounted to $7.3 million for the first year. It supports research in molecular genetics and genetic engineering, protein and nucleic acid chemistry, oncogenic viruses, physical and chemical carcinogenesis, immunology, and the physical characteristics and biology of cancer cells.

The other four firms are small business concerns providing research-related services for all the NCI research at FCRF (including the work being done by Litton Bionetics). The Biological Response Modifiers Program of the Division of Cancer Treatment, four intramural laboratories of its Division of Cancer Etiology, and sections of several laboratories of the Division of Cancer Biology and Diagnosis are now located at FCRF. The contracts also provide support for laboratories of the National Institute of Neurological and Communicative Disorders and Stroke and the National Institute of Allergy and Infectious Diseases located at FCRF.

Program Resources, Inc., Rockville, Md., was awarded the largest contract, $30.1 million for the first year, for operations and technical support, with nearly $28.3 million of that amount supporting NCI activities. Information Management Services, Inc., also of Rockville, was awarded $774,066 for the first year for computer services. Data Management Services, Inc., Frederick, Md., was awarded $557,206 for the first year for scientific library services, and Harlan Sprague Dawley, Inc., Indianapolis, $1,655,097 for the first year for the production of small animals such as mice and rats for research.

In FY 1983, the multicontractor operation was implemented, including a payback system for contractor technical support. DCE's Laboratory of Molecular Oncoloy was moved from the Bethesda campus into newly renovated space at FCRF. The DCBD relocated the Laboratory of Immunobiology, Pathological Technology Section and Membrane Biology Section, to FCRF.

Diet, Nutrition and Cancer Program

In response to a mandate in the National Cancer Act Amendments of 1974, a plan was introduced in

November 1974 for the formation of a Diet, Nutrition and Cancer Program. The program produces and disseminates information on nutrition for cancer patients and on the relationship between nutrition and cancer causation.

The program includes investigations of the effects of diet alterations in man and animals and possible clues to causation from epidemiologic surveys of patterns of diet and cancer incidence.

To improve the effectiveness of cancer therapy, the program supports research on competition and interference between the host and the tumor in the use of cellular nutrients. Methods are being developed to cope with impaired food intake by the cancer patient. Approaches include taste modification and techniques for increasing food intake by hyperalimentation.

On June 16, 1982, a Diet, Nutrition, and Cancer Report commissioned by NCI was issued by the National Research Council of the National Academy of Sciences. The report was a comprehensive summary of current information and included dietary guidelines for the public.

A second report received in June 1983 presented an overview of research needs in diet and cancer causation. A followup symposium entitled "Diet, Nutrition, and Cancer: A Decade Hence" took place in July 1983. These two reports, the symposium, and the NCI plan for Diet, Nutrition and Cancer Prevention developed by NCI staff have formed the basis for implementing a program which includes clinical trials of diets aimed at reducing cancer incidence, studies of modification of eating behavior, development of an international food composition data system and special studies of food composition.

Special Support Mechanisms
In March 1984, through the Division of Extramural Activities, NCI announced the availability of a new grant initiative called the "outstanding investigator grant (OIG)." This provides long-term support (up to 7 years) to experienced investigators with outstanding records of research productivity and encourages investigators to undertake projects of unusual potential in cancer research.

The NCI announced in May 1984 the minority investigator supplement (MIS) to provide support for minority scientists to increase their opportunities and enlarge their capabilities in cancer research through supplements to existing funded research grants. The MIS is administered through the Comprehensive Minority Biomedical Program of the Division of Extramural Activities.

Interagency Agreements
NCI is involved in several cooperative projects with other Federal agencies with facilities or expertise to aid in the cancer research effort. During FY 1984, the Institute funded 78 interagency agreements totaling $16 million.

National Eye Institute

Mission

Conducts, fosters, and supports basic and applied research, including clinical trials, related to the cause, natural history, prevention, diagnosis, and treatment of disorders of the eye and visual system, and in related fields (including visual impairment and its rehabilitation) through:

- Research performed in its own laboratories and clinics;
- A program of research grants, individual and institutional research training awards, career development awards, core grants, and contracts to public and private research institutions and organizations;
- Cooperation and collaboration with professional, commercial, voluntary, and philanthropic organizations concerned with vision research and training, disease prevention and health promotion, and the special health problems of the visually impaired and disabled and blind;
- Collection and dissemination of information on ongoing research and findings in these areas;
- Cooperation and collaboration with domestic and international organizations in worldwide prevention of blindness programs and projects.

Important Events in NEI History

August 16, 1968—Public Law 90-489 authorized formation of the National Eye Institute.

December 26, 1968—The National Eye Institute was established.

April 3-4, 1969—The National Advisory Eye Council held its first meeting.

January 11, 1970—Dr. Carl Kupfer was appointed NEI Director.

December 15, 1970—Reorganization of NEI resulted in the formation of an Office of Biometry and Epidemiology; an Office of the Director of Intramural Research; and a Laboratory of Vision Research and a Clinical Branch as the foci of intramural research.

April 1975—Publication of the National Advisory Eye Council's report, *Vision Research Program Planning,* was the first comprehensive assessment of major needs and opportunities in vision research in the United States.

April 1978—Publication of the National Advisory Eye Council's 5-year plan, *Vision Research: 1978-1982,* included review and analysis of vision research and research training in the United States and discussion of future priorities.

September 1978—A Laboratory of Sensorimotor Research was established within the intramural research program.

November 1978—Public Law 95-623, Health Services Research, Health Statistics, and Health Care Technology Act, authorized NEI to carry out a grants program for construction or renovation of public and nonprofit private vision research facilities.

June 1981—A Laboratory of Molecular and Developmental Biology was established within the intramural research program.

May 1983—Publication of the National Advisory Eye Council's second 5-year plan, a detailed and comprehensive assessment of NEI programs with specific recommendations for development over the next 5 years.

March 1984—A Laboratory of Ophthalmic Pathology was established within the intramural program.

NEI Appropriations—Grants and Direct Operations

Fiscal year	Total grants [1]	Direct operations [2]	Total
	[Amounts in thousands of dollars]		
1970	$22,141	$2,201	$24,342
1971	25,428	4,604	30,032
1972	29,939	7,194	37,133
1973	30,802	7,760	38,562
1974	32,746	8,885	41,631
1975	34,282	9,851	44,133
1976	40,150	10,062	50,212
1977	50,664	13,336	64,000
1978	69,373	16,027	85,400
1979	86,551	18,641	105,192
1980	93,329	19,660	[1] 112,989
1981	97,852	20,131	117,983
1982	104,333	23,041	127,374
1983	116,082	25,819	141,901
1984	126,744	28,387	155,131

[1] Includes construction funds.
[2] Includes contracts, intramural laboratory and clinical research, the Office of Biometry and Epidemiology, program management, and the NIH Management Fund assessment.

Biographical Sketch of NEI Director

Carl Kupfer, M.D.

Dr. Kupfer became the Institute's first Director January 11, 1970. He was formerly professor and chairman of the department of ophthalmology, University of Washington Medical School, Seattle.

Born on February 9, 1928, in New York City, Dr. Kupfer received his A.B. degree from Yale University in 1948 and his M.D. from Johns Hopkins University School of Medicine in 1952. He completed his internship and residency at the Wilmer Eye Institute, and Johns Hopkins Hospital, and was selected to train for 1 year as a research fellow in ophthalmology at the Wilmer Eye Institute and for a second year at Harvard Medical School.

His interest and accomplishments in ophthalmology are numerous. His research in glaucoma has included studies of the circulation of aqueous humor, histopathologic examination of eyes stressed by elevated eye pressures, and developmental anatomy of the eye. He has probed the problems of amblyopia ex anopsia and has contributed important papers on the use of nitrogen mustard for treatment of retinoblastoma, transcorneal electrical potential, corneal fluid pressures and the developmental histology and histochemistry of the neuromuscular junction. He has also studied the neural pathways from the eye to the brain. More recently, he has played a leadership role in fostering the use of well-designed clinical trials in ophthalmology.

Dr. Kupfer was on the editorial board of the *American Journal of Ophthalmology.* He was a member of the NIH Vision Research Training Committee, and the Neurology Program Project B committee. He currently serves on the advisory committee on basic and clinical research of the National Society to Prevent Blindness and is a member of the scientific advisory committee of Fight for Sight, Inc. He is also active in several international organizations involved in blindness prevention. He is scientific adviser to the World Health Organization on its program advisory group for the prevention of blindness and he is on the WHO expert advisory panel on trachoma and prevention of blindness.

In 1977, he was given the Public Service Award in Ophthalmology by the American Academy of Ophthalmology. He was elected to the Society of Scholars at Johns Hopkins University in 1982. Presently, he is a member of the Institute of Medicine, NAS. Civil Service honors include the HEW Secretary's Special Citation "in recognition of his outstanding performance in the development of the National Eye Institute" in 1972. The following year Dr. Kupfer received the HEW Superior Service Award for ". . . accomplishment in developing NEI into an effective program for improving the visual health of the American people."

In 1983, Dr. Kupfer was elected president of the International Agency for the Prevention of Blindness, a multinational consortium committed to reducing the worldwide toll of blinding eye disease.

He received the Pisart Vision Award in 1984, given by the Lighthouse, the New York Association for the Blind, in recognition of his outstanding contributions to vision research as founding Director of NEI.

Major Programs

Retinal and Choroidal Diseases

Most blindness and visual disability in the United States is caused by disorders of the retina, the light-sensitive tissue that lines the back of the eye. Closely related to and helping nourish the retina is the underlying blood vessel layer—the choroid. Because of the interrelationship of the two

structures, diseases affecting one usually involve the other. Unfortunately, for most retinal and choroidal diseases, there is no means of cure or prevention. Progress has been severely impeded by lack of knowledge of fundamental processes underlying retinal and choroidal function.

In response to this need, NEI conducts and supports basic and applied studies on the structure and function of the retina in health and disease. NEI-fostered investigations include studies of the structure and metabolism of photoreceptor cells and their relationship to the underlying pigment epithelium; the retina's response to light and the initial processing of visual information transmitted to the visual centers of the brain; inflammation of the uveal tract (the iris, choroid, and ciliary body); and of the vitreous humor, the clear gel that fills the center of the eye and which assumes importance in a number of ocular disorders.

NEI also supports studies aimed at understanding causes of blindness such as developmental and hereditary retinal disorders; diabetic retinopathy and other vascular and circulatory abnormalities; myopia; ocular tumors; diseases of the macula, the small area of the retina responsible for the central vision used in reading; retinal detachment; and inflammatory disorders, including uveitis. Clinical trials of the effects of treatment in certain retinal diseases, most notably diabetic retinopathy, are under way.

Corneal Diseases

This program encompasses diseases of the cornea—the transparent structure at the front of the eye that helps to focus incoming light rays—and of the external ocular structures, including the conjunctiva and lids. Corneal diseases occur frequently and are perhaps the leading cause of blindness worldwide. They are also, as a group, the most painful.

A corneal disease difficult to treat is caused by the herpes simplex virus. Often characterized by acute recurrences, herpes simplex infections of the cornea account for more sickness and loss of vision than any other corneal infection in Western countries. Also of concern are: inflammatory disorders of the cornea and external eye; dry eyes and tear abnormalities; disorders of the corneal epithelium; corneal edema, dystrophies, and inherited disorders; corneal transplantation and injury and repair of the corneal stroma; tumors and other problems of the lids, conjunctiva, and orbit; and problems associated with correction of refractive errors.

Research supported by the Institute related to corneal diseases includes studies of immunologic mechanisms, corneal opacification, edema, and improved means of drug delivery. Other important areas of corneal research include epidemiologic investigations, studies of the tear film, and tumor virology and immunology.

Cataract

A cataract is an opacity—which interferes with vision—of the normally clear lens of the eye. Although surgery for removal of the lens is a most successful operation, cataract remains a leading cause of blindness in the United States. For this reason, NEI emphasizes research aimed at prevention and nonsurgical treatment of cataract.

NEI's cataract research program concerns a number of types of cataract from varying causes including aging; diabetes; and congenital and metabolic factors. Also of interest are cataracts occurring secondary to injury, radiation, and other eye disorders; dislocated lenses; and accommodation and optical problems of cataract and aphakia. Considerable attention is being given to studies of the chemistry and biophysics of the normal lens.

Glaucoma

This disease is characterized by a distinctive pattern of loss of vision due to damage to the optic nerve and observable changes in the optic nervehead, generally correlated with elevated pressure within the eye. Serious damage to the optic nerve can often be prevented by lowering the intraocular pressure by treatment with drugs or surgery. Such treatments either increase the rate at which fluid—the aqueous humor—leaves the eye or decrease the rate at which it is formed within the eye. The predominant form of the disease is primary open-angle glaucoma; other types are angle-closure glaucoma, glaucoma secondary to other ocular or systemic diseases, and glaucomas of children: developmental, congenital or infantile. Research efforts are devoted to learning how to protect the optic nerve, to improving methods for lowering intraocular pressure, and to developing methods for very early detection of glaucoma and for predicting its clinical course.

Strabismus, Amblyopia, and Visual Processing

This program concerns the structure and function of neural pathways from the retina to the brain, the central processing of visual information, visual perception, optical properties of the eye, functioning of the pupil, and control of the ocular muscles. A large number of congenital, developmental, and degenerative abnormalities affect the visual sensorimotor system, but three disorders are of primary concern: strabismus, amblyopia, and nystagmus. These are frequent causes of visual impairment among children which may persist for life.

Of particular interest are studies of the causes, treatment, and prevention of these disorders. This includes determination of the effects of early sensory deprivation on visual development in infants as well as the normal development of vision. Another major research effort seeks to improve the rehabilitation of the blind or partially sighted.

National Heart, Lung, and Blood Institute*

Mission

Provides leadership for a national program in diseases of the heart, blood vessels, blood, lungs, and in the use of blood and the management of blood resources. It plans, conducts, fosters, and supports an integrated and coordinated program of research, investigations, clinical trials, and demonstrations relating to the causes, prevention, methods of diagnosis, and treatment (including emergency medical treatment) of cardiovascular diseases through research in its own laboratories and through extramural contracts and research grants.

NHLBI plans and directs research in the development, trial, and evaluation of drugs and devices relating to the prevention and treatment of these diseases and the rehabilitation of patients suffering from them.

It conducts studies into the clinical use of blood and all aspects of the management of blood resources, and supports training of manpower in basic and clinical research programs relating to heart, blood vessel, blood, and lung diseases.

Additionally, it coordinates with other NIH research Institutes and Federal agency programs in hypertension, stroke, pediatric respiratory distress, and sickle cell anemia. Coordination is accomplished through an Interagency Technical Committee with representation from NIH, DHHS and other Federal agencies. The NHLBI collects, analyzes and disseminates programmatic data from approximately 30 Federal organizations involved in activities related to the national program.

The Institute also conducts educational activities, including collection and dissemination of educational materials on these diseases—with emphasis on prevention—for health professionals and the lay public, and maintains relationships with institutions and professional associations; international, national, and state and local officials; and voluntary agencies and organizations working in these areas.

NHLBI uses traditional mechanisms such as pre- and post-doctoral fellowship awards and training grants to develop adequate research manpower. In addition, the Institute has formed new research training programs to meet certain specialized manpower needs. These Institute-wide programs include:

- The *national research service award* for individual postdoctoral fellows (NRSA).
- The *national research service awards for institutional research training* (NRSA institutional).
- The *Young Investigator Research Grant Program.*
- The *Minority Access to Research Careers Program* (MARC) administered by the National Institute of General Medical Sciences, includes NHLBI participation in the MARC faculty fellowship program and the MARC visiting scientist award.
- The *Minority Hypertension Research Development Summer Program.*
- The *Minority Biomedical Support Program* initiated by the Division of Research Resources strengthens the biomedical research and training capability of minority institutions. Projects relevant to heart, lung, blood, and blood resources are funded by NHLBI.

Important events in NHLBI History

June 16, 1948—President Harry S. Truman signed the National Heart Act, creating and establishing the National Heart Institute in PHS and the National Advisory Heart Council.

July 7, 1948—The services of Dr. Paul Dudley White were secured under section 4b of the Heart Act "to be Executive Director of the National Advisory Heart Council and Chief Medical Advisor to the National Heart Institute."

August 1, 1948—Surgeon General Leonard A. Scheele, by General Circular No. 36, Organization Order No. 14, established NHI as one of the National Institutes of Health to administer functions of heart research, training, and administration set forth in the National Heart Act. Intramural research projects in cardiovascular diseases and gerontology conducted elsewhere in NIH were transferred to NHI. The Director of NHI was designated as the focal point of leadership and coordination for the total heart program of PHS.

Dr. Cassius J. Van Slyke was named first Director of NHI.

August 29, 1948—Surgeon General Scheele announced the names of the 16 members appointed to the first National Advisory Heart Council.

September 8, 1948—The first meeting of the National Advisory Heart Council was held.

January 1949—Cooperative research units were established at

*Until November 10, 1969, the National Heart Institute; until June 25, 1976, the National Heart and Lung Institute.

the University of California, University of Minnesota, Tulane University, and Massachusetts General Hospital, jointly financed by the institutions and NIH, pending completion of NHI's own research organization and the availability of further research facilities.

July 1, 1949—A comprehensive plan for NHI's intramural research program was instituted, organized on three general research levels, with three laboratory sections, five laboratory-clinical sections, and four clinical sections.

The Heart Disease Epidemiology Study at Framingham, Mass., was transferred from the Bureau of State Services, PHS, to NHI.

January 18–20, 1950—The first National Conference on Cardiovascular Diseases, sponsored by NHI and the American Heart Association, was held in Washington, D.C.

December 1, 1952—Dr. James Watt was appointed Director of NHI to succeed Dr. Van Slyke, who had been appointed Associate Director, NIH.

July 6, 1953—The first patient was admitted to the Clinical Center for heart disease research.

July 1, 1957—The first members of NHI's Board of Scientific Counselors began their terms. The Board was established in 1956 "to provide advice on matters of general policy, particularly from a long-range viewpoint, as they relate to the intramural research program."

February 19, 1959—A report to the Nation was presented by the American Heart Association and NHI on "A Decade of Progress Against Cardiovascular Disease," at Department of Commerce Auditorium, Washington, D.C.

April 21, 1961—The President's Conference on Heart Disease and Cancer, whose participants on March 15 were requested by President John F. Kennedy to assist "in charting the Government's further role in a National attack" on these diseases, convened at the White House and submitted its report.

September 11, 1961—Dr. Ralph E. Knutti was appointed Director of NHI to succeed Dr. Watt, who was appointed to head PHS's international activities.

December 30, 1963—President Lyndon B. Johnson approved a joint resolution, unanimously passed by the Congress, to provide for designating the month of February in each year as "American Heart Month."

November 22–24, 1964—The Second National Conference on Cardiovascular Diseases was held at Washington, D.C., under cosponsorship of the American Heart Association, NHI and Heart Disease Control Program of PHS, to appraise developments since the first conference in 1950 and to determine needs and opportunities for continued and accelerated progress against heart and blood vessel diseases.

December 9, 1964—The President's Commission on Heart Disease, Cancer and Stroke, appointed by President Lyndon B. Johnson, March 7, 1964, to "recommend steps that can be taken to reduce the burden and incidence of these diseases," submitted its report.

August 1, 1965—Dr. William H. Stewart was appointed Director of NHI upon the retirement of Dr. Knutti.

September 24, 1965—Dr. William H. Stewart, NHI Director, was named Surgeon General of PHS.

March 8, 1966—Dr. Robert P. Grant was appointed Director of NHI, succeeding Dr. Stewart. Dr. Grant served until his death August 15, 1966.

November 6, 1966—President Johnson announced the appointment of Dr. Donald S. Fredrickson as Director of NHI to succeed Dr. Grant.

March 15, 1968—Dr. Theodore Cooper was appointed Director of NHI, succeeding Dr. Fredrickson who had elected to return to research activities in the Institute.

October 16, 1968—A Nobel Prize in Physiology or Medicine was awarded to Dr. Marshall W. Nirenberg, chief of NHI's Laboratory of Biochemical Genetics, for discovering the key to deciphering the genetic code. Dr. Nirenberg was the first NIH Nobel laureate and the first Federal employee to receive a Nobel Prize.

October 26, 1968—NHI received the National Hemophilia Foundation's Research and Scientific Achievement Award for its "medical leadership . . . tremendous stimulation and support of research activities directly related to the study and treatment of hemophilia."

November 14, 1968—The 20th anniversary of NHI was commemorated at the White House, with President Johnson and a notable array of prominent figures associated with NHI, past and present, participating.

August 12, 1969—Major provisions of NHI reorganization plan established five program branches in extramural programs (arteriosclerotic disease, cardiac disease, pulmonary disease, hypertension and kidney diseases, and thrombosis and hemorrhagic diseases); a Therapeutic Evaluations Branch and an Epidemiology Branch under the associate director for clinical applications; and three offices in the Office of the Director (heart information, program planning, and administrative management).

November 10, 1969—National Heart Institute was renamed the

National Heart and Lung Institute, reflecting expansion of functions.

February 18, 1971—In his Health Message to the Congress, the President identified sickle cell anemia as a high-priority disease target and called for increased Federal expenditures. Subsequently, the DHEW Assistant Secretary for Health and Scientific Affairs, assigned the lead-agencies responsibilities for coordinating a National Sickle Cell Disease Program to NIH and NHLI.

March 24, 1972—President Nixon named Dr. John S. Millis to head a 20-member panel of experts "to determine why heart disease is so prevalent and so menacing and what can be done about it."

March 27–31, 1972—First meeting of U.S.-U.S.S.R. Joint Committee for Health Cooperation to develop and plan new approach to the health exchange program in several specific areas, including the cardiovascular field. The NHLI Director is a member of the committee.

May 23, 1972—A 5-year agreement for a Cooperative Health Program was signed by W. P. Rogers, U.S. Secretary of State, and B. V. Petrovsky, U.S.S.R. Minister of Health. The agreement calls for cooperative studies in pathogenesis of arteriosclerosis; management of ischemic heart disease; myocardial metabolism; congenital heart disease; sudden death; and blood transfusions, blood components, and the prevention of hepatitis.

June 12, 1972—HEW Secretary Richardson approved a nationwide program of hypertension information and education. The Secretary appointed the Hypertension Information and Education Advisory Committee, chaired by the Director, NIH; and the Interagency Working Group, chaired by the Director, NHLI, to implement the national effort. A High Blood Pressure Information Center was established within the NHLI Office of Information to collect and disseminate public and professional information about this disease.

July 14, 1972—HEW Secretary Richardson approved a reorganization of NHLI, elevating the Institute to Bureau status within NIH, with seven division-level components: Office of Director, Division of Heart and Vascular Diseases, Division of Lung Diseases, Division of Blood Diseases and Resources, Division of Intramural Research, Division of Technological Applications, and Division of Extramural Affairs.

July 24, 1973—The 5-volume *National Heart, Blood Vessel, Lung and Blood Program* was transmitted to Congress. The comprehensive, 5-year plan of attack against heart, blood vessel, lung and blood diseases and research and management of blood resources was developed by the Director, NHLI, with the advice of the National Heart and Lung Advisory Council, in accordance with a provision of the National Heart, Blood Vessel, Lung and Blood Act of 1972 (P.L. 92-423).

April 5, 1974—The HEW Assistant Secretary for Health authorized release of the *Report to the President by the President's Advisory Panel on Heart Disease.* The report of the 20-member panel chaired by Dr. John S. Millis surveys the problem of heart and blood vessel disorders and recommends how illness and death from these disorders may be reduced.

August 2, 1974—Regulations were approved governing the establishment, support, and operation of National Research and Demonstration Centers for heart, blood vessel, lung, and blood diseases. The regulations concern the implementation of Section 415(b) of the PHS Act, as amended by the National Heart, Blood Vessel, Lung and Blood Act of 1972, which authorized the establishment and support of National Research and Demonstration Centers.

September 16, 1975—Dr. Robert I. Levy was appointed Director of NHLI. He succeeded Dr. Theodore Cooper, who accepted the position of HEW Deputy Assistant Secretary for Health on April 19, 1974. Dr. Robert L. Ringler served as Acting Director of NHLI during much of the interim.

June 25, 1976—NHLI was redesignated the National Heart, Lung, and Blood Institute by the Health Research and Health Services Amendments of 1976 (P.L. 94-278). The 1976 act further enlarged Institute authority to advance the national attack on heart, blood vessel, lung, and blood diseases and the conduct of research in the use of blood and blood products and in the management of blood resources.

October 28, 1977—The U.S.-U.S.S.R. Cooperative Health Program was renewed for another 5 years with the signing of an agreement by Dr. Julius B. Richmond, HEW Assistant Secretary for Health, and Dr. Dmitri D. Venedictov, U.S.S.R. Deputy Minister of Health.

NHLBI Legislative Chronology

June 16, 1948—The National Heart Act (P.L. 80-655) authorized NHI. The purpose of the act was "To improve the health of the people of the United States through the conduct of researches, investigations, experiments, and demonstrations relating to the cause, prevention, and method of diagnosis and treatment of diseases of the heart and circulation; assist and foster such researches and other activities by public and private agencies, and promote the coordination of all such researches

and activities and the useful application of their results; provide training in matters relating to heart diseases, including refresher courses for physicians; and develop, and assist States and other agencies in use of the most effective methods of prevention, diagnosis, and treatment of heart diseases."

June 25, 1948—The Second Deficiency Appropriation Act of 1948 (P.L. 80–785) appropriated "For an additional amount, Fiscal year 1949 for 'National Institute of Health, operating expenses,' $500,000: *Provided,* that appropriations under said head for the Fiscal year 1949 shall be available for carrying out the purposes of the National Heart Act, including erection of temporary structures for storage of equipment and supplies and housing of animals."

June 29, 1949—The Labor-Federal Security Appropriation Act 1950 (P.L. 141) appropriated $10,725,000 for expenses necessary to carry out the purposes of the National Heart Act, including grants-in-aid for drawing plans, erection of buildings, and acquisition of land therefor, and, in addition to the amount appropriated, authorized "the Surgeon General, upon recommendations of the National Advisory Heart Council, to approve applications for research and training grants, including grants for drawing plans, erection of buildings, and acquisition of land therefor, not to exceed a total of $5,350,000, for periods beyond the current Fiscal year, and such grants shall, if approved during the current Fiscal year, constitute a contractual obligation of the Federal Government."

August 15, 1950—The Omnibus Act of 1950 (P.L. 81–692) provided for the termination of all appointments to the heart and other councils on September 30, and for appointment of a full new membership on October 1, 1950. The act established uniformity in composition of membership and term of office for all councils.

December 30, 1963—House Joint Resolution 848 (P.L. 88–254) of the 88th Congress was approved. This authorized and requested the President to issue an annual proclamation designating February as American Heart Month, inviting governors of states and territories to issue similar proclamations, and urging that the U.S. people give heed to the heart disease problem and support all essential programs required to bring about its solution.

October 6, 1965—An act (P.L. 89–199) provided supplemental appropriations for fiscal year 1966 to implement recommendations of the President's Commission on Heart Disease, Cancer, and Stroke that fall within existing legislative authorities. NHI received funds to expand training programs and plan research centers.

May 16, 1972—The National Sickle Cell Anemia Control Act (P.L. 92–294) established a national program for the diagnosis, control, and treatment of and research in sickle cell anemia. The act does not mention NHLI but has special pertinence because NHLI has been designated to coordinate the National Sickle Cell Disease Program.

September 19, 1972—The National Heart, Blood Vessel, Lung, and Blood Act of 1972 (P.L. 92–423) enlarged the authority of the Institute to advance the national attack on heart, blood vessel, lung, and blood diseases. The act provides for expanded, intensified, and coordinated Institute activities in accordance with a comprehensive, specified National Heart, Blood Vessel, Lung, and Blood Disease Program to be planned by the Director and the National Heart and Lung Advisory Council. Other provisions include the establishment of prevention and control programs; development of 15 new centers for basic and clinical research, training, demonstration, and prevention programs for heart, blood vessel, and blood diseases; and development of 15 such centers for chronic lung diseases.

June 25, 1976—Title I of the Health Research and Health Services Amendments of 1976 (P.L. 94–278) redesignated NHLI as National Heart, Lung, and Blood Institute to advance the national attack on heart, blood vessel, lung, and blood diseases, and to conduct research in the use of blood and blood products and in the management of blood resources. The NHLBI Director with the aid of the National Heart, Lung, and Blood Advisory Council continue to plan the national program under the basic P.L. 92–423 provisions with some refinements. The 1976 act provided $349 million (program and control activities) for FY 1976 and $403 million for FY 1977.

Biographical Sketches of NHLBI Directors

Cassius James Van Slyke, M.D.
Dr. Van Slyke, first Director of NHI, was born in Benton, Minn., on December 1, 1900. He took his medical degree at the University of Minnesota in 1928 and entered the PHS reserve corps the same year.

In 1932, he was commissioned in the regular corps of PHS. From 1936 to 1944, Dr. Van Slyke pursued a distinguished career of experimental research at the PHS Venereal Disease Research Laboratory, Staten Island, N.Y., and in 1944 he was made assistant chief of the Venereal Disease Division, Washington, D.C.

He was appointed chief of the Division of Research Grants and Fellowships, NIH, in 1946,

continuing until named Director of NHI on August 1, 1948. He left NHI on November 30, 1952, to serve as Associate Director of NIH. He served in that position until December 3, 1958, when he was named the first Deputy Director of NIH, serving in that capacity until his retirement on December 1, 1959. He died April 21, 1966.

James Watt, M.D., D.P.H.
Dr. Watt served as Director of NHI from December 1, 1952, through September 10, 1961. Born April 28, 1911, at Thomasville, Ga., he received his M.D. from Johns Hopkins School of Medicine in 1935 and his doctorate in public health from the Johns Hopkins School of Hygiene and Public Health in 1936.

A member of the Commissioned Corps of PHS since 1938, he spent most of his professional life in the conduct and administration of medical research and public health activities. He was director of enteric disease research at the School of Tropical Medicine in Puerto Rico from 1940 to 1942.

For the next 3 years Dr. Watt worked in Louisiana's Charity Hospital on a study of drugs in treatment of diarrheal diseases. In 1945, the Chinese Government requested his services in the investigation and control of a serious outbreak of cholera in Chungking.

For several years prior to his appointment as Director of NHI in 1952, he was in charge of the field laboratory of the National Microbiological Institute (now NIAID) located at Louisiana State University Medical School. He directed NHI nearly 9 years, until accepting an appointment to head the Office of International Health, PHS. In 1967, Dr. Watt became Special Assistant to the Surgeon General for Program Review, serving until his retirement from PHS in December 1968.

Ralph E. Knutti, M.D.
Dr. Knutti, the third Director of NHI, was born in Palo Alto, Calif., in 1901. He received his M.D. at Yale University in 1928. After a year as assistant in pathology at Vanderbilt University and his internship in surgery at Lakeside Hospital, Cleveland, he received an appointment in pathology and bacteriology at the Rockefeller Institute for Medical Research in New York.

From 1932 to 1942 he was instructor, then assistant professor in the pathology department of the University of Rochester. He became associated with the pathology department at the University of Southern California Medical School in 1942 and served as associate professor, 1948–1951.

Joining the PHS Commissioned Corps in 1951, he was assigned to the National Institute of Arthritis and Metabolic Diseases as chief of its extramural programs, and in 1960 he was appointed associate director for extramural programs. Dr. Knutti is internationally recognized in academic and medical circles for achievements in advancing medical education and training in the biomedical sciences. He became Director of NHI on September 11, 1961, and served until his retirement from PHS July 31, 1965.

William H. Stewart, M.D.
Born in Minneapolis, Minn., in 1921, Dr. Stewart attended the University of Minnesota from 1939 to 1941. He received his M.D. from Louisiana State University in 1945.

In 1945–46 he interned at Philadelphia General Hospital, after which he served in the U.S. Army Medical Corps until 1948. For a short time thereafter he was on the staff of the Veterans Administration Outpatient Clinic in St. Paul, Minn. From 1948 to 1950 he was resident in pediatrics at Charity Hospital, New Orleans, La. He was in private practice in Alexandria, La., from 1950 until joining the PHS Commissioned Corps in 1951.

Among Dr. Stewart's PHS assignments have been: head, epidemiology unit, Thomasville (Ga.) Field Station, Communicable Disease Center; chief, Heart Disease Control Program; assistant director of NHI; assistant to the Surgeon General; chief, Division of Public Health Methods; and chief, Division of Community Health Services.

Prior to his appointment on August 1, 1965, as NHI Director, he was assistant to the Special Assistant to the Secretary (Health and Medical Affairs) of DHEW.

Dr. Stewart was Director for less than 2 months when on September 24, 1965, he was named Surgeon General, PHS. He served in this post until his retirement from PHS on August 1, 1969.

Robert P. Grant, M.D.
Dr. Grant, fifth Director of NHI, was born September 17, 1915, in Orillia, Ontario, Canada. He received an A.B. degree from Cornell University in 1937 and his M.D. from Cornell University Medical College in 1940. During 1940–42, he interned and then was assistant resident at the Peter Bent Brigham Hospital, Boston. The next 3 years, he served in the Medical Corps, U.S. Air Force.

From 1945 to 1947, he was assistant resident in medicine at the New York Hospital, and a research associate at Tulane University Medical School. For 3 years, he was assistant professor of physiology and instructor in medicine at Emory University, Atlanta.

Entering PHS in 1950, Dr. Grant served continuously with NHI until 1961. He conducted research in electrocardiography, vector electrocardiography, cardiac pathology, and clinical cardiology, and was chief of the

Section on Cardiodynamics, General Medicine and Experimental Therapeutics Branch, until 1959. He then administered the Institute's program of training grants and fellowship awards from 1959 to 1961 as assistant chief of the Grants and Training Branch and chief of the Training Grants and Fellowships Section.

Following a year as visiting professor at the University of Goettingen, West Germany, the University of Vienna, Austria, and the University of Leiden, The Netherlands, he joined the Office of International Research, NIH, in 1962, serving first as assistant chief, then chief, of the European Office in Paris. He was appointed Director of NHI March 8, 1966, and served until his sudden death August 15, 1966.

Donald S. Fredrickson, M.D.
Born August 8, 1924, in Canon City, Colo., Dr. Fredrickson received his B.S. at the University of Michigan in 1946 and his M.D. at Michigan in 1949. He did postgraduate work at Peter Bent Brigham Hospital, Massachusetts General Hospital, and Harvard Medical School, Boston, prior to joining the NHI scientific staff as a clinical associate in 1953.

When appointed Director of NHI on November 6, 1966, Dr. Fredrickson was serving (since 1961) as the Institute's clinical director, with responsibility for all NHI research involving patients and normal volunteers.

His research achievements have earned him international recognition as an authority on fat transport in the circulation and on the diseases of lipid metabolism. From 1955 to 1961, as a senior research staff member of the Laboratory of Cellular Physiology and Metabolism, he participated in a series of studies that resulted in fundamental contributions to scientific knowledge of mechanisms whereby fats and fatlike substances are transported, synthesized, and broken down by the body. These studies also investigated the effectiveness and mode of action of various drugs that reduce blood levels of cholesterol and other lipids.

Subsequently, first with the Laboratory of Metabolism, then as chief of the Laboratory of Molecular Diseases, Dr. Fredrickson conducted and directed laboratory and clinical research on the structure of plasma lipoproteins, their role in fat transport, and on genetic factors that regulate lipoprotein metabolism. His studies of heritable disease of fat storage and metabolism included the discovery of the lipoprotein deficiency state, Tangier disease, and establishment of its mode of inheritance.

In 1965, he and his colleagues introduced a new system for identifying and classifying blood-lipid abnormalities on the basis of plasma lipoprotein patterns. Five distinct lipid-transport disorders, termed hyperlipoproteinemias types I–V, are distinguishable under this system which is now widely used by laboratories in this country and abroad.

Dr. Fredrickson elected to return to research in March 1968 as chief of the Molecular Diseases Branch, NHI. On March 6, 1969, he was appointed NHI's director of intramural research, a post he held until June 30, 1974, when he assumed the position of president of the Institute of Medicine, National Academy of Sciences.

On July 1, 1975, he returned to NIH where he was sworn in as NIH Director. Dr. Fredrickson resigned as NIH Director on June 30, 1981, returning to the NAS as a visiting scholar.

Theodore Cooper, M.D., Ph. D.
Dr. Cooper, the seventh Director of NHI and the first under the redesignated name NHLI, was born Dec. 28, 1928, in Trenton, N.J. He received his B.S. degree from Georgetown University, Washington, D.C., in 1949, and his M.D. and Ph. D. degrees from St. Louis University in 1954 and 1956.

Prior to becoming Director on March 15, 1968, he was NHI's associate director for Artificial Heart-Myocardial Infarction Program. As head of the program, Dr. Cooper directed an intensive research effort combining bioengineering and biomedical approaches to the reduction of death and disability from acute heart attacks.

He had also been affiliated with the Institute some years earlier, holding staff appointments with NHI's Clinic of Surgery from 1956 to 1958 and again from 1959 to 1960. He left NHI in 1960 to join St. Louis University School of Medicine. In 1961, he was named director of that university's Center of Cardiovascular Research.

In 1966, Dr. Cooper went to the University of New Mexico Medical School as professor and chairman, department of pharmacology, and professor of surgery. He was on leave-of-absence from this post while serving as NHI associate director for Artificial Heart-Myocardial Infarction Program.

From 1964 to 1967, he was on Pharmacology and Experimental Therapeutics A Study Section, an advisory body of the Division of Research Grants, NIH. He has held several distinguished editorial appointments.

In 1972, Dr. Cooper received the DHEW Superior Service Honor Award and the Alumni Merit Award of St. Louis University.

On April 19, 1974, he accepted the position of HEW Deputy Assistant Secretary for Health, and on July 1, 1975, was sworn in as HEW Assistant Secretary for Health by President Gerald R. Ford.

Dr. Cooper left government service on January 20, 1977. He became dean and provost of the Cornell University School of Medicine in July 1977 and has since joined the Upjohn Company as executive vice president.

Robert L. Ringler, Ph. D. (Acting)
Dr. Ringler served as Acting Director, NHLI, from April 19, 1974, to July 14, 1975. He was born March 27, 1922, in Chase, Mich. He received his A.B. in chemistry and biology from Central Michigan College in 1951, and his Ph. D. in biochemistry from Michigan State University in 1955.

He was assistant professor of the department of biochemistry, North Carolina State College (1955–57), and senior research associate at the Edsel B. Ford Institute for Medical Research, Henry Ford Hospital, Detroit (1957–61), before coming to the NHI in 1961 as a scientist administrator.

From 1962 to 1966, Dr. Ringler served as chief of the NHI's Program Projects Branch, and was largely responsible for the successful development and rapid growth of the program project grant concept into a major Institute mechanism for supporting research.

In 1966, he headed the Task Force on Cardiovascular Research Centers, and in 1967 was appointed chief, Institutional Research Programs. He was appointed deputy director in 1969 and served in that post for 5 years prior to serving as Acting Director. As initial DHEW Coordinator for Sickle Cell Anemia 1971–72, he played a major role in launching the National Sickle Cell Disease Program.

Dr. Ringler's main research interests are respiratory enzymes, electron transport, protein chemistry, and the purification and mechanism of action of enzymes and intermediary metabolism.

He received the HEW Superior Service Honor Award in June 1970.

Dr. Ringler left NHLBI in January 1978 to become deputy director of the National Institute on Aging.

Robert I. Levy, M.D.
Dr. Levy was appointed Director of NHLI on September 16, 1975. He was born May 3, 1937, in the Bronx, N.Y. He received a B.A. in zoology from Cornell in 1957, and his M.D., from Yale University Medical School in 1961 and also won the Kees Prize for his research thesis.

Before becoming Institute Director, he had served since November 1973 as director of the NHLI Division of Heart and Vascular Diseases. He planned and directed Institute programs aimed against arteriosclerosis and its complications, such as heart attacks and strokes; high blood pressure and hypertensive heart disease; congenital and rheumatic heart disease; heart failure and shock; and various kidney disorders.

Dr. Levy, with NHLBI since 1963, joined the scientific staff as a clinical associate in the Molecular Diseases Branch. He became head of that branch's Section on Lipoproteins in 1966 and was named chief of the Lipid Metabolism Branch in 1970.

In the latter post, he established a continentwide network of Lipid Research Clinics to carry out research on blood-lipid abnormalities.

Dr. Levy's main research interests are lipoproteins and lipid transport; lipid metabolism, diseases of lipid storage and metabolism and approaches to atherosclerosis in relation to hyperlipidemia.

In 1975, he received the Arthur S. Flemming Award and the DHEW Superior Service Award, and in 1976, the Humanitarian Award from the Associated Health Foundation.

Dr. Levy left NHLBI in September 1981 to join Tufts University as vice president for health sciences and dean of its school of medicine.

Claude Lenfant, M.D.
Dr. Lenfant was appointed NHLBI Director on July 6, 1982. He was born on October 12, 1928, in Paris, France. He received his B.S. degree in 1948 from the University of Rennes, France, and his M.D. in 1956 from the University of Paris.

Upon completing his medical studies, he assumed the position of director of the Laboratory of Experimental Surgery, Centre Marie Lannelongue, in Paris. While there he directed research into extracorporeal oxygenation of blood and the use of deep hypothermia in cardiac surgery.

In 1957, Dr. Lenfant was appointed postdoctoral fellow at the University of Buffalo, and the following year continued that appointment at Columbia University in New York. His postdoctoral interests were directed to respiratory and circulatory physiology.

Returning to France, he assumed a teaching position as assistant professor of physiology at the University of Lille. He soon returned to the U.S., however, where he was appointed to a joint position in the departments of medicine and of physiology and biophysics at the University of Washington, Seattle. He published extensively on the dynamics of blood-gas exchange in humans and various other species under normal conditions and under conditions of altitude and pressure. Respiratory adaptation to hypoxia, anemia, alkalosis and acidosis also were investigated.

In 1970, Dr. Lenfant was appointed the first associate director for lung programs of the

then National Heart and Lung Institute, and also assumed the position of acting associate director for collaborative research and development programs. Under his direction, this program evolved into the present Division of Lung Diseases, formed in 1972, with Dr. Lenfant as its director. For his accomplishments he was awarded the HEW Superior Service Honor Award in 1974. Under his directorship the Division of Lung Diseases continued to grow and to coordinate a strong and diverse program of research into the prevention, diagnosis and treatment of lung diseases.

He became NIH Associate Director for International Research and Director of the Fogarty International Center for Advanced Study in the Health Sciences in 1981, positions he held until his appointment as Director of NHLBI.

Dr. Lenfant is a member of a number of professional societies including the American and French Physiological Societies, the American Society for Clinical Research, the American Society for Clinical Investigation, and the Association of American Physicians. He is on the editorial boards of the *American Journal of Physiology, Journal of Applied Physiology, American Review of Respiratory Disease, Undersea Biomedical Research, Revue Francaise des Maladies Respiratories* and others. He has published more than 140 papers in his areas of research interests.

NHLBI Programs

Division of Heart and Vascular Diseases

This Division plans and directs a program of fundamental research, clinical research, clinical trials, research training, prevention, education, demonstrations and control of heart and vascular diseases. These diseases affect at least 40 million persons and continue as the leading cause of death in the United States.

Important progress in the reduction of morbidity and mortality from these diseases is being achieved, shown by a 25 percent reduction in death rates over the past 10 years. Despite these favorable reductions in rates, cardiovascular diseases still accounted for 50.8 percent of all deaths in 1980 and slightly over one million deaths (1,004,000). Major program areas of the Division are described below.

NHLBI Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1950	$8,634	$2,091	$10,725
1951	11,676	2,523	14,200
1952	7,515	2,567	10,082
1953	8,706	3,294	12,000
1954	11,576	3,592	15,168
1955	12,510	4,158	16,668
1956	13,690	5,208	18,898
1957	26,755	6,641	33,396
1958	28,224	7,712	35,936
1959	36,056	9,557	45,613
1960	50,935	11,302	62,237
1961	74,140	12,760	86,900
1962	114,182	18,730	132,912
1963	127,464	19,934	147,398
1964	117,541	14,863	132,404
1965	108,303	16,521	124,824
1966	120,075	21,387	141,462
1967	130,874	33,896	164,770
1968	131,763	36,191	167,954
1969	128,840	38,087	166,927
1970	130,206	41,171	171,377
1971	141,280	53,637	194,925
1972	158,808	73,880	232,688
1973	177,709	122,291	300,000
1974	187,215	115,700	302,915
1975	201,844	122,786	324,630
1976	242,054	127,959	370,013
1977	262,673	133,988	396,661
1978	294,085	153,824	447,909
1979	337,725	172,409	510,134
1980	370,016	157,472	527,488
1981	404,978	144,715	549,693
1982	420,545	139,092	559,637
1983	476,107	148,152	624,259
1984	551,293	153,646	704,939

Arteriosclerosis, Hypertension and Lipid Metabolism Program
The atherogenesis program supports research grants, Specialized Centers of Research (SCOR) relating to the etiology and pathogenesis of arteriosclerosis, a National Research and Demonstration Center in Cardiovascular Disease, nonhuman primate resources for arteriosclerosis research and special research initiatives.

A related research program in lipid metabolism studies the function of lipids and lipoproteins as they relate to atherosclerosis.

The hypertension research program supports grants, SCOR's in hypertension, and research directed at determining the causes, mechanisms of development of hypertension, and factors that may provide knowledge for improved treatment and possible disease prevention.

Fundamental and Metabolic Research. Investigated are the fundamental level of factors that may influence the etiology, pathogenesis or prevention of atherosclerosis. Factors as lipoprotein structure, function and genetics, sterol metabolism, blood platelet pathophysiology, immunological vascular interactions, smoking, nutrition and diabetes are under study.

Pathogenesis of Arteriosclerosis. This program investigates, at fundamental and applied levels, the causes, development and nature of arteriosclerotic plaques, their regression, and prevention. Examples include normal vascular structure and function; the behavior of vascular cells of all types, in situ and in cell culture; cell populations; vascular injury and repair; and the complications of plaques.

Coronary Artery Arteriosclerosis. Research is supported on the study of arteriosclerosis, its causes, development, complications, and prevention.

Peripheral Vascular Arteriosclerosis. Studies aid in characterizing arteriosclerosis as manifested in the peripheral arteries, particularly those of the leg. Also sought are similarities and differences in etiology, pathogenesis and

prevention between this vascular site and others.

Cerebrovascular Disease. This program promotes the study of the causes, development, complication and prevention of cerebrovascular diseases that may affect the vessels of the head and neck.

National Research and Demonstration Centers in Cardiovascular Disease. These centers assist in the study of all cardiovascular phenomena and diseases within the context of basic and applied research and with specific identification of education, control and demonstration research projects. The center at Baylor College of Medicine established in 1974 has funding until December 1982.

Nonhuman Primate Resources. Breeded and provided are nonhuman primates with chronic dietary atherosclerosis or experimental hypertension. Investigators in arteriosclerosis, hypertension, and lipid metabolism use these primates to more easily study long-standing disease states, chronic lesions and lesion regression. Six resource centers for research in arteriosclerosis and hypertension have been established.

SCOR in Arteriosclerosis. Specialized Centers of Research in arteriosclerosis promote development of new information about arteriosclerosis through multidisciplinary and team research. Intercenter collaboration creates economics of time, effort, and resources to improve understanding of all aspects of arteriosclerosis. Fifteen centers were established in 1971 and 1972 at U.S. medical institutions. At present eight SCOR's in arteriosclerosis are supported.

Lipid Research Clinics. Twelve Lipid Research Clinics in North America and one in Jerusalem conduct collaborative studies under rigidly standardized protocols. These include standardized laboratory methods for lipids and lipoproteins. Epidemiological studies have provided extensive data on the relationship of lipids and lipoproteins to diet and to coronary heart disease.

Lipid Research Clinics' Coronary Primary Prevention Trial. This clinical trial involving 3,800 men with type II hyperlipoproteinemia has an objective to determine whether reduction of plasma cholesterol by cholesterol-lowering diet and drug (cholestyramine) will significantly lower the incidence of coronary heart disease over a 7-year followup period. The study, in its maintenance phase, is scheduled to be completed in July 1983.

Hypertension

Hypertension, the most prevalent cardiovascular disorder, afflicts an estimated 35 million American adults, accounts for some 20,000 deaths a year, and is a potent risk factor in increasing illness or death from stroke, congestive heart failure, coronary heart disease, or kidney failure. NHLBI programs directed against this disorder include the following.

The National High Blood Pressure Education Program, involving NHLBI and other Federal and non-Federal organizations, was initiated in 1972. It is designed to alert the general public to the 1) wide prevalence of hypertension, especially among U.S. blacks; 2) threats to life and health by uncontrolled hypertension; 3) availability of effective measures for blood pressure control; and 4) benefits attending adequate therapy.

SCOR's in Hypertension. The overall objective of this research is to expedite gaining knowledge of the causes, mechanisms and treatment of hypertension. Beginning in 1971 in five medical institutions, the program has held open competition and funded five centers to conduct basic and clinical research on blood pressure control mechanisms.

Twelve special research programs on the role of the central nervous system in hypertension were initiated in 1979. A project on the role of microcirculation in hypertension was initiated with funding of nine grants in 1980. These extend research in areas that have not received adequate attention by investigator-initiated research.

Epidemiology and Biometry Program

Epidemiological studies seek to establish the role of risk factors for coronary heart disease (CHD), hypertension, stroke and peripheral vascular disease. These studies have provided strong evidence that elevated blood cholesterol, elevated blood pressure, cigarette smoking, diabetes, type A personality, and lack of physical activity increase the risk of development of coronary heart disease. Programs supported include:

The Framingham Heart Disease Epidemiology Study

The Honolulu Heart Program

The Puerto Rico Heart Program

The NHLBI Twin Studies

The High Blood Pressure in the Young Program.

Cardiology Program

The cardiology program supports research in heart function and normal and abnormal mechanisms of heart action such as arrhythmias, failure, and shock. Other areas include advanced diagnostic methods and in therapies of cardiac and vascular disorders.

SCOR's in Ischemic Heart Disease. Eight SCOR's in ischemic heart disease are being supported in major medical centers to conduct comprehensive fundamental and

clinical research. Types of studies by multidisciplinary investigators encompass myocardial infarction (MI), angina pectoris, arrhythmias, cardiac resuscitation, quantifying infarct size, and biochemical studies of heart muscle changes during ischemia.

Multicenter Investigation of Limitation of Infarct Size (MILIS). Five clinical centers in a randomized clinical trial are evaluating the effectiveness of propranolol and hyaluronidase in reducing the size of damaged heart muscle resulting from acute MI.

Coronary Artery Surgery Study. This collaborative clinical trial involves 16 centers in the U.S. and Canada. The objective is to assess the effects of coronary bypass grafts on morbidity and mortality in chronic coronary heart disease patients with stable angina pectoris. Enrollment of 780 patients was completed in May 1979. Followup will continue until May 1983.

Cardiovascular Devices. Research and development continues to improve prototype cardiovascular devices for partial or total replacement of heart function. Primary efforts are directed to develop ventricular assist devices to aid the failing heart for several weeks, if needed. Less emphasis is being directed to long-term (2-year) and potentially permanent (5–10 years) devices that would be placed within the body.

Other efforts include advanced methods of diagnosis particularly by noninvasive instrumentation such as detection and measurement of arteriosclerotic plaques within the carotid, coronary, and larger arteries of the limbs.

Clinical Applications and Prevention Program

Collaborative clinical trials are used to assess promising methods for primary prevention of cardiovascular disease and therapeutic measures that seek to reduce morbidity and death after heart disease has become manifest. Other areas emphasize research in preventive cardiology, nutrution, behavioral medicine, community demonstration and education research. Statewide programs in high blood pressure control are also supported.

Hypertension Detection and Follow-up Program (HDFP)

The HDFP is a community-based, randomized controlled trial involving 10,940 persons with high blood pressure, comparing the effects on 5-year mortality of a systematic antihypertensive treatment program (stepped care) and referral to community medical therapy (referred care). Paticipants were recruited by population-based screening of 158,906 people aged 30 to 69 years in 14 communities throughout the U.S. They were randomly assigned to stepped care or referred care groups within each center and by entry diastolic blood pressure (DBP) (90 to 104, 105 to 114, and 115 + mm Hg). Over the 5 years of the study, more than two-thirds of the stepped care participants continued to receive medication, and more than 50 percent achieved blood pressure levels within the normotensive range, at or below the HDFP goal for DBP. Five-year mortality from all causes was 17 percent lower for the stepped care group compared to the referred care group and 20 percent lower for the stepped care subgroup with entry DBP of 90 to 104 mm Hg compared to the corresponding referred care subgroup. These findings indicate that the systematic effective management of hypertension has a great potential for reducing mortality for the large numbers of people with high blood pressure in the population, including those with "mild" hypertension.

Study participants have been given the findings and referred to their personal physicians or clinics to continue antihypertensive therapy. Followup of study participants will continue for 3 more years.

HBP Demonstration Programs. Two urban and three rural research demonstrations are in progress to develop effective models of education, management and followup in populations with high prevalence of HBP. The success of the HDFP in showing that long-term management of high blood pressure can be accomplished and that a reduction in mortality can be expected from such improved management provide justification for this direct transaction of the research findings into medical practice. The programs involve cooperation of physicians, health providers, pharmacists, community agencies and persons with HBP.

Statewide Coordination Projects for HBP Control. This congressionally mandated program aims to determine the impact of statewide coordination of resources and activities on blood pressure control. It is being carried out in California, Connecticut, Maryland, South Carolina, Georgia, Maine, and Michigan. Baseline surveys have been conducted and coordination activities undertaken. Assessment of change in awareness of high blood pressure, extent of treatment and control in these populations will be made after 5 years to evaluate the results.

Multiple Risk Factor Intervention Trial (MRFIT). This trial involves 12,866 men at 22 U.S. clinical centers. Its objective is to determine whether a special intervention program designed to reduce high serum cholesterol, elevated diastolic blood pressure and use of tobacco will significantly lower coronary heart disease mortality and nonfatal

myocardial infarction over a 6-year period.

The study's first 4 years have been summarized in the July 1981 issue of *Preventive Medicine.* Long-term reduction of three major CHD risk factors has been achieved in a high proportion of the men in the special intervention group. The effects of such reduction upon mortality and nonfatal MI will remain blinded until this study is completed in September 1982.

Nutrition Education

Improved knowledge and skills in nutrition and counseling for dietitians and nutritionists are important in providing effective assistance to persons seeking reduction of high blood lipids or high blood pressure by dietary means. The experience from cardiovascular nutrition studies such as the Institute's MRFIT, LRC and SCOR programs has provided educational techniques for professionals involved in nutrition counseling. Examples of activities in nutrition education are:

Regional workshops on nutritional counseling in hyperlipidemia being conducted at the University of Pittsburgh and the University of Iowa.

Joint workshops at NHLBI and the American Heart Association on diffusion of innovative nutrition counseling skills.

Training materials and manuals which have been developed and distributed are:

A Model Workshop for Nutrition Counseling in Hyperlipidemia for Nutritionists and Dietitians.

Heart to Heart: A Manual on Nutrition Counseling for the "Current Nutrition Issues in Hypertension" for publication in the *Journal of the American Dietetic Association.*

Division of Lung Diseases

The Division plans and directs research in lung diseases, encompassing basic and targeted research, clinical and demonstration trials, national pulmonary centers, technological development, and application of findings. The Division assesses the national need for research in the causes, prevention, diagnosis, and treatment of lung diseases; in technological development; and for manpower training in these areas.

SCOR's on Pulmonary Diseases.

The lung division supports 19 SCOR's with emphasis on pediatric, chronic airway, fibrotic and immunologic, pulmonary vascular diseases and adult respiratory failure. Ongoing research includes therapeutic and diagnostic approaches to prevent infant respiratory distress syndrome.

A national research and demonstration center at the University of Vermont:

- Carries out basic and clinical research on occupational pulmonary disorders resulting from prolonged exposure to harmful dusts and fumes.
- Provides demonstrations in a community setting of advanced methods of prevention, diagnosis, and treatment.
- Provides a training resource for scientists and physicians concerned with these diseases.
- Carries out information and education programs.

A March 1977 Task Force Report on Prevention, Control and Education in Respiratory Diseases recommended programs to provide an educational link between what is known in medical research centers and how to prevent or control diseases of the lung (other than lung cancer), and what individuals, communities, and health professionals in community practice need to learn to utilize this knowledge.

The Division supports two clinical trials to evaluate:

- The efficacy of long-term, intermittent positive pressure breathing treatment when used as an adjunct to the overall care of ambulatory patients with chronic obstructive lung disease.
- The effects of corticosteroids, administered 24 to 72 hours before birth, on the incidence of infant respiratory distress syndrome.
- The efficacy of nocturnal low-flow oxygen therapy, in contrast to continuous therapy, in patients with chronic hypoxic lung disease and cor pulmonale.

Other NHLBI-supported research concerns:

- Lung structure and function.
- Epidemiological studies to ascertain the prevalence of chronic obstructive lung disease and to identify factors affecting individual susceptibility.
- Treatment of chronic obstructive lung disease, including inhalation therapy and intensive respiratory care.
- Cigarette smoking, air pollution, and other lung irritants as causative or aggravating factors in chronic lung diseases other than cancer.
- Vascular lung diseases, such as pulmonary hypertension, cor pulmonale, and pulmonary edema.
- Early detection and clinical management of pulmonary fibrosis and hypersensitivity lung diseases.
- Structural, biochemical and physiologic mechanisms of acute lung injury leading to adult respiratory failure.
- Pediatric pulmonary disease including neonatal respiratory distress syndrome, cystic fibrosis and bronchiolitis.

Pulmonary Academic Awards, to help meet the need for researchers, clinicians, and teachers in pulmonary physiology and chronic lung disease, have been made to 65 schools since the program's inception in 1971.

NHLBI New Investigator Research Grant Program provides modest support for research projects. The program is designed to enable new scientists and physicians to explore their developing research interests, and to encourage fundamental as well as clinical research.

The National Pulmonary Faculty Training Program is intended to:

- Strengthen pulmonary faculties at schools of medicine and osteopathy yet to develop adequate respiratory disease programs.
- Provide support for 1) a training environment at medical centers with strong pulmonary academic programs and 2) junior faculty from medical schools which wish to strengthen their pulmonary academic programs.
- Provide an opportunity for junior faculty members (from schools wishing to strengthen their pulmonary academic programs) to obtain extensive pulmonary training at medical centers where the training environment is supported through this program.

Since 1975, six awards have been made to medical centers, and 26 medical schools have received funds for junior faculty.

Division of Blood Diseases and Resources

This Division plans and directs the NHLBI's research grant, contract, and training programs to improve the diagnosis, prevention, and treatment of blood diseases and related disorders and to assure the efficient and safe use of an adequate supply of high-quality blood and blood products. Programs include fundamental and clinical research, professional development and training to fill projected needs, and education, prevention and control activities to assure orderly application of knowledge gained through research.

Thrombosis and Hemostasis. The Institute conducts biomedical research aimed at improving scientific and medical understanding, diagnosis, treatment, and prevention of thrombosis and hemorrhage. Supported activities include basic, applied and clinical research into all phases of the coagulation process.

An additional element of this program includes *SCOR's on Thrombosis.* During 1981 the Institute supported four centers. Among the studies being carried out are:

- Plasma components involved in coagulation.
- The function and metabolism of blood platelets and factors influencing their aggregation and deaggregation.
- Diagnostic techniques for detecting hypercoagulable states and for detecting, localizing, and assessing the extent of clinical thrombosis.
- Clinical studies of anticoagulant and clot-dissolving agents in the prevention and treatment of thromboembolic episodes.

Red Blood Cell Disorders and Erythropoiesis. This program supports fundamental and clinical research in red blood cell production, maturation, and function in normal and disease states. Areas of interest include: Cooley's anemia (thalassemia) and iron overload; erythropoiesis and stem cell kinetics; hemoglobin synthesis and structure as well as that of metallocomplexes; red cell membrane structure and function; cellular enzyme disorders; red cell and blood rheology; and oxygen transport.

Sickle Cell Disease. The Institute supports basic and clinical research and demonstration activities to reduce the morbidity and mortality from sickle cell disease. The national Sickle Cell Disease Program, coordinated by NHLBI, is a cooperative endeavor involving other Institutes of NIH, the Health Services Administration, Centers for Disease Control, and other Federal agencies.

Several activities currently supported under this program are noted below.

- Comprehensive sickle cell centers focus resources, facilities, and manpower in a coordinated approach to sickle cell disease, bridge the gap between research and service, and bring findings in one area into practical use in the other. Specific research projects include those related to molecular, cellular, tissue and organ studies as well as clinical management, training, and education. Community services encompass demonstration projects in education, screening, counseling and rehabilitation.
- Basic research is supported on globin synthesis, structural and conformational changes of sickle hemoglobin, alterations in blood flow, function of the cell membrane and diagnostic techniques.
- Clinical trials are conducted on vaso-occlusive crises and promising new forms of therapy.
- Screening and education programs are planned for communities to provide information, screening, counseling, and definitive diagnosis of sickle cell disease,

and referral of patients for appropriate followup care.

- The education program focuses on the community on a nationwide basis to provide information on sickle cell anemia and trait. Educational approaches and techniques used are audiovisuals, workshops, lectures, seminars, pamphlets, exhibits and brochures.

Blood Resources. This program plans, supports and coordinates the Institute's extramural blood resource goals to assure the efficient use and accessibility of an adequate supply of high-quality blood and blood products.

Programs currently supported are:

- The National Blood Program assures accessibility of an adequate supply of high-quality blood and blood products through studies of blood resource management, the establishment of a national blood data system, and recommendations concerning the structure and function of the national blood resource system. Blood resource management strives to improve the management of our national blood resource through studies of current blood procurement procedures, donor recruitment strategies, manpower training needs, dynamics of regional supply systems and methods for promoting the safety of blood service operations. The national blood data systems promote more effective planning in management of national blood resources through collection and analysis of national blood resource data.
- The Safety of Blood Therapy Program deals with problems related to blood compatibility and the transmission of disease that occurs in using whole blood and blood component therapy.
- The Blood Component Therapy Program reduces the use of whole blood by encouraging employment of specific component therapy rather than whole blood; is responsible for providing guidelines for the use of blood components; encourages better methods for assessing their effectiveness; and supports research to improve methods of blood separation and preservation. Particular emphasis is placed on the following:

Platelets. Develop improved technology for the efficient, safe, and rapid separation and optimal storage of platelets derived from whole blood, and develop definitive guidelines for the clinical transfusion of platelet concentrates.

Leukocytes. Determine and clarify parameters of collection and function of various white blood cells (neutrophils) as related to effective transfusion therapy.

Erythrocytes. Clarify guidelines relating to proper use of concentrates of red blood cells; advance technology in immunohematology; and refine and improve methods of preservation to ensure an adequate blood supply.

Plasma Components. Develop new methods of plasma fractionation, including clinically useful trace components, and support clinical trials for FDA licensure of these new components and methods.

- The Hepatitis Program strives to prevent morbidity and mortality from post-transfusion hepatitis and other transfusion-transmitted infections.
- The Blood Substitutes Program is developing a clinically useful blood substitute for conserving and supplementing natural blood and blood products.

U.S.-U.S.S.R. Health Exchange Program. U.S.-U.S.S.R. collaboration in blood resources and their uses in the treatment of disease has resulted in reciprocal visits and plans for coordinated efforts by delegations of Soviet and American scientists. Information exchanged during these meetings concerned the blood collection and transfusion systems in both countries, including: blood preservation methods; utilization of blood components; transfusion technology; hepatitis problems; effects of massive blood transfusions; use of blood in cardiovascular surgery; problems related to the use of blood in heart bypass systems and other disorders; and artificial blood substitutes.

Division of Intramural Research

The 18 Bethesda-based laboratories and branches of the NHLBI intramural research program conduct a variety of basic and clinical studies on the cardiopulmonary system, blood, and endocrine systems in health and disease.

Fibrotic (or interstitial) lung diseases account for about 20 percent of all chronic lung disorders. They often disable, are largely untreatable, and frequently kill their victims within 5 years after appearance of overt symptoms. These diseases may have many causes—inhalation of toxic substances, excessive radiation exposure, hypersensitivity, etc.—or may have no discernible cause (idiopathic pulmonary fibrosis), but all are characterized by the formation of scar tissue (fibrosis), often throughout the lung.

NHLBI studies indicate that lung scarring that occurs in idiopathic pulmonary fibrosis is not due to excessive production of collagen by collagen-synthesizing cells of lung, as had been previously thought. Lung tissue from patients with this disease produced collagen at rates comparable to cells from "normal" lungs. This finding suggests that the problem is not excessive collagen production per se, but rather normal rates of synthesis in the wrong places.

Other studies indicate that, in patients with idiopathic pulmonary fibrosis, the lymphocytes, which normally help protect the lung against "foreign" invaders such as bacteria, react to the connective tissue of the patient's lung as though it were foreign and so tend to attack it. Hence immune and cell-mediated mechanisms may play prominent roles in the progressive disruption of lung connective tissue that occurs with this disease.

Recent studies on the molecular defects in patients with dyslipoproteinemia have revealed new insights into several diseases. Tangier disease—characterized by orange tonsils, hepatosplenomegaly, recurrent neuropathy, intracellular accumulation of cholesterol ester, and a striking deficiency of plasma high density lipoproteins (HDL)—was shown to be due to a structural defect in apoA-I (apoA-I Tangier), one of the two major apolipoproteins of HDL.

Type III hyperlipoproteinemia, a disease characterized by tuberoeruptive xanthomas, increased plasma levels of cholesterol and triglycerides, and premature cardiovascular disease has been proposed to be due to a defect in metabolism of chylomicron remnants. These are normally cleared from the plasma by a high affinity apolipoprotein E (apoE) specific receptor system in the liver. Two new molecular defects of the E protein have been discovered which produced type III hyperlipoproteinemia. The first defect, most common in patients with type III, is a structural flaw in apoE (designated $apoE_2$). The second defect is a complete absence of apoE in the plasma of affected individuals. The absence or presence of a structurally abnormal E protein results in delayed clearance of chylomicron remnants and the lipoprotein abnormalities characteristic of type III hyperlipoproteinemia.

High density lipoproteins have been suggested to be important in transporting cholesterol out of cells, thereby conferring some degree of protection against atherosclerosis, a disease characterized by cholesterol deposits in arteries. A new cause for severe deficiency HDL and premature heart disease is an absence of plasma apoA-I. Patients with A-I absence have early heart disease associated with low HDL levels further supporting the hypothesis that HDL may have an important role in cholesterol metabolism and the development of premature atherosclerosis.

National Institute of Allergy and Infectious Diseases

Mission

The National Institute of Allergy and Infectious Diseases conducts and supports research to better understand the causes of allergic, immunologic, and infectious diseases, and to develop better means of preventing, diagnosing, and treating illnesses.

Encompassed in the Institute mission are studies on the following:

- The immune system, its genetic control, maturation, characteristics, and manipulation.
- Disorders and derangements of the immune system including asthma and other allergies, immune deficiency states, and autoimmunity.
- The role of the immune system in the pathogenesis of chronic diseases, such as arthritis, chronic glomerulonephritis, and lupus erythematosus.
- The etiology, epidemiology, and pathogenesis of all types of infections (including those caused by viruses, mycoplasma, bacteria, fungi, and parasites) involving a variety of organ systems.
- The diagnosis, treatment, and prevention of all types of infections including research on antibiotics; antimicrobial, antifungal and antiviral therapy; antisera; and vaccines.
- The role and mechanism of nucleic acid recombination in microbial agents, and the manipulation of nucleic acid recombination to produce medically or technologically useful hybrids. Also, the assessment and control of risks of such research.

Important Events in NIAID History

1948—The National Microbiological Institute was established November 1 with Dr. Victor H. Haas as first Director. The Rocky Mountain Laboratory and the Biologics Control Laboratory, both dating to 1902, were incorporated into the new Institute, together with the Division of Infectious Diseases and the Division of Tropical Diseases of NIH.

1951—An Institute-supported grants program was initiated, and a branch was established to administer research, training, and fellowship grants. Grant

applications were reviewed by the National Advisory Health Council until 1956.

1955—The National Microbiological Institute became the National Institute of Allergy and Infectious Diseases on December 29. Dr. Haas remained as Director. The Biologics Control Laboratory was detached from the Institute and expanded to Division status within NIH.

1956—The first meeting of the National Advisory Allergy and Infectious Diseases Council was held March 7-8.

1957—The Laboratory of Immunology was established in January to meet the growing need for research on the mechanisms of allergy and immunology.

Dr. Justin M. Andrews became the Director of NIAID in April.

The Middle America Research Unit was established in the Canal Zone jointly by NIAID and the Walter Reed Army Institute of Research as a temporary field station, made permanent in 1961. Important studies on tropical diseases were conducted there for 15 years. NIAID transferred its portion of the program to the Gorgas Memorial Institute in 1972.

1962—A collaborative research program funded mainly by contracts was established within the Institute to plan, coordinate, and direct nationwide projects on infectious diseases, vaccine development, transplantation immunology, research reagents, and antiviral substances.

1964—Dr. Dorland J. Davis became Director of NIAID upon the retirement of Dr. Justin M. Andrews.

1968—With the dissolution of NIH's Office of International Research and creation of the Fogarty International Center on July 1, 1968, programs formerly managed by OIR were transferred to NIAID to be administered by the Geographic Medicine Branch. These included 1) the U.S.-Japan Cooperative Medical Science Program, initiated in 1965 by the President and the Japanese Prime Minister to explore the health problems of Asia, and 2) the International Centers for Medical Research and Training, a 1960 Congressional initiative to advance the status of U.S. health sciences through international research.

1971—The first seven Allergic Disease Centers were established to translate basic concepts of the biomedical sciences into clinical investigations. The centers have subsequently expanded to 15.

1974—The first centers for the study of sexually transmitted diseases and of influenza were established.

1975—Dr. Richard M. Krause became the Director of NIAID in November.

1977—The NIAID Extramural Research Program was reorganized into three areas: Microbiology and Infectious Diseases; Immunology, Allergic and Immunologic Diseases; and Extramural Activities. Centers for gastroenteritis and diarrheal disorders were established, and an intramural Laboratory of Immunogenetics was formed.

1978—The first maximum containment facility (P4) for recombinant DNA research was opened in Frederick, Md. International program project grants and international exploratory/development research grants programs were established. Centers were created for interdisciplinary research on immunologic diseases.

1979—The Office of Recombinant DNA Activities was transferred from the National Institute of General Medical Sciences to NIAID. The International Collaboration in Infectious Diseases Research Program superseded the International Centers for Medical Research and Training established 1960.

The Rocky Mountain Laboratory was reorganized into the Laboratory of Persistent Viral Diseases to deal with both host and viral mechanisms leading to slow or persistent viral infections; the Laboratory of Microbial Structure and Function, directed at bacterial diseases, particularly sexually transmitted diseases; and an Epidemiology Branch.

1981—The Laboratory of Immunoregulation was established to provide a means for applying new knowledge in immunology to the clinical diagnosis and treatment of patients with immunological disorders. A Laboratory of Molecular Microbiology was created to exploit new techniques in recombinant DNA methodology and other molecular studies to expand the Institute's interests in both bacterial and viral pathogenesis and virulence.

1984—The Office of Tropical Medicine and International Research (OTMIR) was established to coordinate NIAID's intramural and extramural research activities in tropical medicine and other international research. OTMIR works with other Federal agencies and international organizations active in these areas.

NIAID Legislative Chronology

November 1, 1948—The National Microbiological Institute was established under authority of section 202 of the Public Health Service Act, as implemented by General Circular No. 55, Organization Order No. 20, dated October 8, 1948.

December 29, 1955—NIAID was established (replacing the National Microbiological Institute) under authority of the Omnibus Medical Research Act (P.L. 81-692, 64

Stat. L. 443) as implemented by PHS Briefing Memorandum of November 4, 1955, from the Surgeon General to the Secretary of Health, Education, and Welfare.

Biographical Sketches of NIAID Directors

Victor H. Haas, M.D.
Dr. Haas was born in Cincinnati, Ohio, on January 6, 1909. He received a B.S. degree in 1929, a B.M. degree in 1931, and an M.D. in 1932, all from the University of Cincinnati.

After joining the Commissioned Corps of PHS in 1932, he conducted investigations of encephalitis in St. Louis in 1933, spent the following year at NIH, and from 1935 to 1939 served at the PHS Plague Laboratory in San Francisco.

During World War II, Dr. Haas was detailed as chief of the Medical Commission to the Yunnan-Burma Railway in China and staff officer in the China-Burma-India Theater. He served as the officer in charge of PHS malaria investigations from 1943 to 1948.

He was appointed Director of the National Microbiological Institute (later renamed NIAID) on November 1, 1948, and continued in that post until April 1957. He retired from PHS on January 1, 1961.

Justin M. Andrews, Ph. D., Sc. D.
Dr. Andrews was born in Providence, R.I., on August 28, 1902. He received a Ph. D. degree from Brown University in 1923, and an Sc.D. degree in 1926 and honorary LL.D. in 1951 from Johns Hopkins University.

He taught at Johns Hopkins School of Hygiene and Public Health from 1926 to 1938, except for 1930–31, when he served as visiting professor of parasitology at the University of the Philippines in Manila. He became a special member of the Rockefeller Foundation in 1929.

From 1938 to 1942, Dr. Andrews was director of the division of malaria and hookworm service of the Georgia Department of Public Health in Atlanta. He was commissioned in PHS in 1941, and at the outbreak of World War II, he joined the Sanitary Corps of the U.S. Army. He was assigned to malaria control activities in the North African, Mediterranean, and Pacific Theaters, and advanced to the rank of colonel.

After the war, he returned to PHS as deputy chief and then chief of the Communicable Disease Center in Atlanta. In 1957, he was assigned to the Washington Office of the Bureau of State Services with the rank of Assistant Surgeon General. He was appointed Director of NIAID in April 1957 and continued in this post until his retirement from PHS on October 1, 1964. He died June 29, 1967.

Dorland J. Davis, M.D., D.P.H.
Dr. Davis was born in Chicago, Ill., on July 2, 1911. He received a B.S. degree from the University of Illinois in 1933, an M.D. from the Johns Hopkins University in 1937, and D.P.H. degree from Johns Hopkins in 1940.

He became a commissioned officer in PHS in 1939 and was first assigned to the Division of Infectious Diseases, National Institute of Health. In 1943, he served in North Africa as a member of a medical team investigating endemic diseases, particularly malaria and typhus.

Dr. Davis returned to the Division of Infectious Diseases and, in 1954, was appointed chief of the Laboratory of Infectious Diseases, National Microbiological Institute (now NIAID). In 1956, he was named associate director in charge of research; in 1962, director of intramural research; and on October 1, 1964, Director.

In August 1968, he was promoted to the rank of Assistant Surgeon General. He retired from PHS on August 1, 1975.

Richard M. Krause, M.D.
Dr. Krause was born in Marietta, Ohio, on January 4, 1925. He received a bachelor of arts degree from Marietta College in 1947 and in 1952 was graduated from Western Reserve University School of Medicine, now Case-Western Reserve University. In the course of his medical studies, he participated in epidemiologic research on the prevention of rheumatic fever, an experience which awakened his early research interest in the relationship between infection and immunity.

Following medical school, he took his internship and residency at Barnes Hospital, St. Louis, Mo. In 1954, he joined the Rockefeller Institute and Hospital (now Rockefeller University) as an assistant physician, and later was promoted to associate professor. In 1962, he assumed professorships in epidemiology and medicine at the Washington University School of Medicine in St. Louis. Four years later, he returned to Rockefeller University where he was a professor and senior physician prior to his appointment as NIAID Director in 1975.

Dr. Krause had an active interest in the practical application of research findings to the prevention and control of disease. He identified, for example, the patterns of spread of streptococci in families and communities and was one of the leaders who sparked a renewed interest in the problems of sexually transmitted diseases.

He was awarded the DHEW Distinguished Service Medal in 1979 for outstanding leadership in guiding the Institute and for his contributions to immunology and microbiology. He was promoted to Assistant Surgeon General in 1977.

In July 1984, Dr. Krause retired from the PHS and is now dean of Emory University School of Medicine in Atlanta. He was also named Robert W. Woodruff professor of medicine.

Anthony S. Fauci, M.D.

Dr. Fauci was born in Brooklyn, New York, in 1940. A graduate of the College of the Holy Cross, he received his M.D. degree from Cornell University Medical College in 1966. After completing an internship and residency at Cornell Medical Center in 1968, he came to the NIH as a clinical associate in the Laboratory of Clinical Investigation, NIAID. In 1977 he was appointed deputy clinical director of the Institute and in 1980, chief of the Laboratory of Immunoregulation, both positions he still holds. He was appointed NIAID Director in November 1984.

He has made many contributions in basic and clinical research in the area of the pathogenesis and treatment of immune-mediated diseases. He has pioneered the field of human immunoregulation by making a number of basic scientific observations which serve as the basis for the current understanding of the regulation of the human immune response. In addition, he is widely recognized for delineating the precise mechanisms whereby immunosuppressive agents modulate the human immune response. He has developed cures for several formerly fatal diseases such as polyarteritis nodosa, Wegener's granulomatosis, and lymphomatoid granulomatosis.

In recent years, Dr. Fauci has undertaken investigations on the acquired immune deficiency syndrome (AIDS), which have led him to characterize the immune defect found in the disorder. He is conducting clinical trials with AIDS patients aimed at finding more effective treatments for the opportunistic infections experienced by AIDS victims and at reversing the underlying immunodeficiency.

In 1979 he received the annual Arthur S. Flemming Award given to 10 oustanding young employees in the Federal Government. The same year he was presented the PHS Meritorious Award. He received the 1983 Squibb Award of the Infectious Diseases Society of America for "achievement in the investigation of infectious diseases." The Distinguished Service Medal was awarded to him in 1984. Most recently he was given the FDA Commissioner's Special Citation. Currently a national councillor with the American Federation of Clinical Research, he was president of the federation, 1980–81.

Dr. Fauci is a member of the American Society for Clinical Investigation, the Association of American Physicians, the Infectious Diseases Society of America, the American Academy of Allergy, and the American Association of Immunologists, among others. He also serves on the editorial boards of the *Journal of Clinical Investigation* and the *American Journal of Medicine* as well as numerous other scientific journals. He is associate editor of *Current Therapy in Internal Medicine*, an editor of *Harrison's Principles of Internal Medicine*, and author or coauthor of more than 450 scientific publications, including several textbooks.

Special Programs

Despite major research advances, allergic and infectious diseases remain high among the Nation's great public health problems. As a group, they rank fifth in the leading causes of death.

Patients with infectious diseases account for 20 to 30 percent of all visits to physicians' offices, while 40 million Americans suffer from asthma and allergies at an estimated cost for care and medications of $4 billion. Asthma is the primary cause of disability among children.

NIAID Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1954	$2,067	$3,671	$5,738
1955	2,227	3,953	6,180
1956	2,227	5,548	7,775
1957	8,182	5,117	13,299
1958	11,591	5,809	17,400
1959	17,091	6,980	24,071
1960	26,280	7,774	34,054
1961	35,141	8,859	44,000
1962	43,900	12,191	56,091
1963	49,256	16,886	66,142
1964	51,175	17,548	68,723
1965	51,288	18,559	69,847
1966	56,062	21,925	77,987
1967	64,809	25,861	90,670
1968	66,454	27,968	94,422
1969	66,086	28,754	96,840
1970	74,248	29,446	103,694
1971	70,285	32,083	102,368
1972	75,486	33,689	109,175
1973	78,557	34,857	113,414
1974	76,908	39,092	114,000
1975	78,093	41,359	119,452
1976	82,390	44,462	126,852
1977	90,928	50,272	141,000
1978	106,318	56,023	162,341
1979	130,340	60,988	191,328
1980	153,010	62,354	215,364
1981	168,154	63,923	232,077
1982	169,690	66,205	235,895
1983	199,289	79,840	279,129
1984	226,407	93,189	319,596

No simple solution exists for either infectious diseases or immunologic disorders, such as allergies. However, practical limitations on resources compel NIAID to establish research priorities—that is, to emphasize problems that appear to be most important or most vulnerable to current technology.

An example is the Institute's special effort concerning the newly identified, highly fatal condition called acquired immune deficiency syndrome, or AIDS. NIAID is supporting and conducting major projects to define the epidemiology and natural history of the disease; establish a repository for tissues and fluids as a research resource; develop methods for early detection of the disease; study the disease's immunologic abnormalities; and conduct

therapeutic trials with agents to attempt to reconstitute the immune system.

Additionally, the Institute has a considerable amount of other work related to AIDS research, which encompasses the study of cellular immunity as a general phenomenon, interferon, and lymphokines, sexually transmitted disease research, and opportunistic infections. NIAID allotted more than $19 million for AIDS research in 1984.

A number of other programs have been singled out for special attention and are described in the following sections under Microbiology and Infectious Diseases, or Immunology, Allergic and Immunologic Diseases—the Institute's two primary extramural program areas.

Microbiology and Infectious Diseases

Acquired Immune Deficiency Syndrome

AIDS has emerged as one of the highest priority programs of the extramural program and is supported in part by special funding from Congress. In addition to small, case-control epidemiological studies of Haitian immigrants, intravenous drug abusers, and homosexual men, two longitudinal cohort studies designed to elucidate risk factors for AIDS have begun with NIAID support; one study in health care workers at the NIH, and the other involving over 5,000 homosexual men residing in five American cities who will be followed for 3 years. Systematic collections of biological specimens from these men will be deposited in a national repository for future use by investigators. Research on AIDS includes studies of the immunological dysfunctions leading to opportunistic infections. Collaborative treatment trials of immunosuppressed patients and their opportunistic infections are under way using biological response modifiers, new antimicrobials and new combinations of licensed drugs. Particular attention has been directed toward new or improved therapy of cryptosporidiosis, Mycobacterium avium-intracellulare, Pneumocystis carinii, and candidiasis; drug development, in vitro testing and animal models are part of this treatment program.

Respiratory Infections

Respiratory infections are the major cause of acute illness in the United States. Efforts to control influenza, a leading virus-caused respiratory disease, have been channeled into development of vaccines and antiviral compounds. At present, the best method of preventing influenza is through immunization. NIAID, therefore, pursues the development and testing of new vaccines—such as live attenuated—as well as the evaluation of inactivated preparations. A candidate attenuated vaccine for influenza A infections is currently undergoing clinical studies. The effectiveness of amantidine as an anti-influenzal compound has now been solidly confirmed and the effectiveness of rimantadine, an analog of amantadine, has also been demonstrated. Influenza research is complemented by virus surveillance activities in the United States in human as well as animal populations. These surveillance studies will increase understanding of the origins of influenza pandemics. In addition, the support of basic research on influenza viruses and the host's response to influenza virus infection remains an important objective.

Other viruses such as respiratory syncytial (RS) and parainfluenza (types 1, 2, and 3) are etiologic agents for the majority of croup, bronchitis, and pneumonia in infants and children. Sensitive, rapid immunochemical tests are being developed to allow physicians to diagnose these infections in time to aid in the care of the patient. Inactivated vaccines against these diseases have not been successful. Several live attenuated vaccines for RS virus are being developed and tested. Success in developing animal models for RS virus infection has been reported, and studies with these models should provide considerable information on pathogenesis and immunology. In addition, increased emphasis on viral causative agents of lower respiratory disease in children will provide insights into development of effective control measures.

Hepatitis

Viral hepatitis types A, B, and non-A, non-B constitute a worldwide health problem. NIAID directs its hepatitis research effort toward control of these diseases. Institute-sponsored studies include epidemiology, biochemistry, immunology, biophysics, autiviral therapy, microbiology, animal models, vaccine development and clinical trials. Inactivated hepatitis B vaccines prepared from purified spherical particles of surface antigen from the plasma of human chronic carriers have been shown to be safe and effective. These vaccines have been licensed and are commercially available. Approaches to a cheaper vaccine include in vitro synthesis of HB_sAg determinants by chemical means or DNA recombinant technology. Several such recombinant DNA vaccines are being evaluated in clinical trials. An animal model has recently been developed in which hepatitis B infections and complications of cirrhosis are liver cancer mimic those of man. Hepatitis A virus has been successfully grown in several cell culture systems, and

experimental hepatitis A vaccines are now being developed. Recently, the hepatitis A virus genome has been cloned and its DNA sequence determined. Thus, second and third generation vaccines are possible.

Continuing efforts in viral hepatitis research are aimed at defining the epidemiology of non-A, non-B hepatitis as well as identifying causative agents. To date, efforts to develop assay systems for antigen or antibodies to non-A, non-B viruses have been unsuccessful.

The recently described delta agent has been implicated in more severe forms of hepatitis B infections. Efforts are in progress to describe the epidemiology of the delta agent and to characterize this defective agent by biochemical and biophysical techniques.

Sexually Transmitted Diseases

Gonorrhea has been classified as a national epidemic, according to public health authorities who estimate that more than 2.5 million new cases occur annually in the United States. In addition, syphilis remains a disease of public health significance, accounting for 80,000 new cases each year. Other diseases transmitted by the sexual route, now appearing more frequently, are nongonococcal urethritis and genital herpes infections.

NIAID is implementing recommendations of its 1980 Study Group on Sexually Transmitted Diseases (STD). The study group report called for an expanded program of research on the basic biology and immunology of all microorganisms (bacterial, viral, and parasitic) known to be or suspected of being specific causes of STD. It also recommended further study to develop better diagnostic tests and more effective therapeutic drugs for the STD's, as well as research leading to the development and testing of vaccines. Under study are some infections caused by chlamydial agents, herpes and cytomegaloviruses, group B streptococci, mycoplasmas, and trichomonads. Studies of growth, nutrition, and physiology of these organisms and investigations leading to their purification and characterization are being supported. Other projects focus on specific antibody development, cellular and humoral defenses, mechanisms of recurrent infection or reinfection, and development of antibiotic resistance.

Development of experimental animal model systems and tissue culture methods are also part of this program. Newer diagnostic techniques and materials, mathematical modeling of epidemics, and development of potential vaccine materials are equally important.

Gonococcal protein vaccines—the most promising vaccine candidates to date—have demonstrated antigenicity in animals and are being tested in humans.

A candidate polysaccharide vaccine has also been prepared for type III group B streptococci. The vaccine is being given to pregnant women during thier third trimester. The purpose of the study is to determine whether the level of placental antibody transferred during fetal development is adequate to protect neonates as high risk to the disease.

Hospital-Associated Infections

Hospital-associated, or nosocomial, infections have in recent years emerged as a significant health problem and cause of excess morbidity and mortality. They are also directly involved in spiraling health care costs. An estimated 2 million hospital-associated infections occur annually in the United States. Many patients undergoing immunosuppressive therapy are at risk to infections caused primarily by opportunistic microorganisms that usually do not pose a problem for well persons.

Studies are being carried out on immune mechanisms, both cellular and humoral, that protect healthy people against normal microbial flora commonly encountered every day. Disturbances in resistance mechanisms in hospitalized or immunocompromised patients will be a major research focus. Gram-negative bacilli are primary etiologic agents and many have become resistant to antibiotics. Methicillin-resistant staphylococcus, aspergillus in the immunosuppressed, and Pneumocystis carinii transmission in hospitals have recently emerged as important problems. Certain viral and parasitic agents as well as fungal species are also under investigation.

Interaction of microbial products, such as toxins, with serum components resulting in the shock syndrome are of interest, as are corrective measures. Research on the hospital environment, including viral transmission mechanisms and epidemiologic investigations, is also supported. Part of this effort has been directed toward the SENIC project (Study on the Efficacy of Nosocomial Infection Control), an unprecedented retrospective study for determining rates of hospital infections. Conducted by the Centers for Disease Control, this project should identify problems suited for targeted research.

Parasitic Diseases

The complexity of structure and function of parasites has made the study of immunological responses to these agents exceptionally challenging and rewarding. Goals of NIAID-sponsored studies on the immunology of parasitic diseases include the development of effective vaccines against malaria, schistosomiasis, filariasis, etc.; the intervention in the host response to

prevent immunologically mediated disease processes; and the development or improvement of immunodiagnostic procedures.

NIAID's program on biological regulation of vectors aims to advance fundamental studies that might lead to effective control methods that do not include using synthetic organic pesticides with deleterious side effects. Studies have been directed toward the use of diseases, parasites, or predators that attack and harm the vector. Other studies focus on displacing the vector from the environment by an organism that does not transmit disease, or on modifying vector behavior to easily kill or otherwise prevent it from transmitting disease.

NIAID supports two contracts to provide investigators with animals and vectors infected with species of schistosomes and filariae. The contracts supply parasite materials to parasitologists and researchers in immunology, pharmacology, biochemistry, etc., who are unable to maintain complicated parasite life cycles but need the materials to help solve complex problems involved in the ultimate control of these important diseases.

Enteric Diseases

Gastroenteritis, still one of the five leading causes of childhood deaths in North America, is also one of the top five causes of absences from school and work and one of the ten most common causes of visits to the doctor and admissions to hospitals. Morbidity and mortality from gastroenteritis is even more severe in developing countries of the world.

Basic research on gastrointestinal immunity and on bacterial virulence factors, including enterotoxins, represent important areas for investigation. New laboratory diagnostic techniques to study the epidemiology, cause and pathogenesis of acute gastroenteritis are being carried out at an Enteric Diseases Center established by NIAID in Baltimore and in the Fort Apache Indian Reservation, Arizona.

Major efforts are under way to develop and to test oral vaccines against bacteria causing traveler's diarrhea, such as enterotoxigenic E. coli, and against cholera, shigellosis, typhoid fever and rotavirus. Recombinant DNA engineering and monoclonal antibodies will help accelerate vaccine development. The Institute also supports limited studies to improve oral rehydration solutions used to treat diarrhea and dehydration.

Bacterial Vaccines

Although effective antimicrobial agents have been developed, increasing numbers of bacterial strains resistant to antibiotics have evolved. In addition, in many cases, the onset and progression of bacterial diseases are so rapid that effective antibiotic treatment is not possible. NIAID directs efforts toward developing and testing bacterial vaccines. A new 23-valent pneumococcal vaccine was recently developed and licensed for persons over 2 years of age at high risk of developing pneumococcal infections. The Institute continues to evaluate the vaccine in patients with diverse conditions leading to pneumococcal infections.

Polysaccharide vaccines have been developed against Neisseria meningitidis and Haemophilus influenzae type b—primary causes of bacterial meningitis. A group A meningococcal vaccine was recently shown effective in infants in a trial during an epidemic in Finland. Other meningococcal vaccines and the H. influenzae vaccine, while effective in adults and older children, are ineffective in infants. NIAID now intends to test a new generation of meningitis vaccines that will be effective in infants. These candidate vaccines involve the coupling of bacterial polysaccharide components with other antigens. Clinical trials are in progress to test the safety and antigenicity of these new vaccines in infants. Also, NIAID has initiated an efficacy trial of a new H. influenzae type b vaccine in Alaskan Eskimo infants. Studies are also under way to protect infants by the administration of hyperimmune globulins at birth or by hyperimmunization of the mother.

Improvement of the pertussis (whooping cough) vaccine is a primary goal of NIAID. Studies are directed toward development and testing of acellular vaccines that will be less reactive and at least as effective as the current whole cell vaccine. Various commercial firms are actively involved in the production and clinical testing of these acellular vaccines, with the assistance of NIAID's vaccine evaluation units.

Antibiotic Trials

As promising new antibacterial and antifungal agents are developed by the pharmaceutical industry, they must be critically evaluated for safety and efficacy in man. NIAID picks for trial licensed and unlicensed drugs that the pharmaceutical industry is unlikely to test further in man, even though the drugs may show considerable clinical promise. NIAID studies—controlled, prospective, and multicentered—are designed to compare efficacy, safety, duration, and costs with standard chemotherapeutic agents. A collaborative effort often exists among the drug manufacturer, the Food and Drug Administration, the clinical investigators, and the NIAID as sponsoring agency. Currently, the NIAID supports a trial of new systemic antifungal agents and an improved treatment regimen for urinary tract infections in women.

Antiviral Substances

Control of viral diseases relies primarily on administration of immune serum globulins or vaccines when available; but a need exists to develop antiviral substances, either as therapeutic or prophylactic agents, for a broad variety of viral diseases.

Adenine arabinoside (ara-A), identified as an effective therapeutic compound against herpes encephalitis, was licensed for use in 1978. It has been found to be equally effective against neonatal herpes. It has recently been approved for treatment of varicella zoster (shingles) infections in immunocompromised individuals. Interferon is being evaluated for treatment of initial genital herpesvirus infections in women, of laryngeal papillomatosis in children, and of genital warts in adults.

Clinical trials with ara-A, ara-AMP, and other promising antivirals such as acyclovir will be continued and broadened. Oral acyclovir, developed by Burroughs-Wellcome Laboratories, is highly specific for herpesviruses and underwent extensive clinical evaluation before its recent approval for certain patients with genital herpes. Another promising compound is 9-(1,3-dihydroxy-2-propoxymethyl)guanine (DHPG). Animal studies of DPHG are continuing and phase I studies are currently under way. Other studies involve searches for better methods of interferon production, mechanisms of action of interferon (including its role of immune regulatory functions), development of new antivirals and mechanisms of viral inhibition. Further data on the use of amantadine and its analog, rimantadine, in the prophylaxis and therapy of influenza A are being gathered.

Additionally, animal models mimicking viral diseases in man are important in antiviral development. They serve as a ready mechanism to screen and evaluate new antiviral substances. The animal models available are currently being used to evaluate a number of compounds including the fluoropyrimidines. Both in vitro and in vivo testing of combinations of antiviral agents have also been initiated.

Molecular Biology

During the past few years, the development of certain techniques in the area of molecular biology have made it possible to construct functional DNA molecules in vitro that contain segments derived from diverse biological sources. Scientific innovations leading to this technological breakthrough were mostly derived from basic studies on the mechanism of restriction—which normally acts as a barrier to gene flow among microorganisms—and the molecular biology and genetics of bacterial plasmids, especially those specifying drug resistance. Whereas DNA recombination in nature has been random, experimental techniques now enable in vitro construction and subsequent replication of DNA molecules needed for specific experimental goals. This basic knowledge coupled with refinements of existing technology should ultimately provide a greater understanding of the pathogenicity (at the molecular level) of viral, bacterial, mycotic, and parasitic agents. This may in turn lead to improved prevention, diagnosis and treatment of infectious diseases. Another goal is the synthesis of biologically useful substances through the construction of bacterial cells containing functional DNA of either plant or animal origin.

International Biomedical Research

The Institute's International Biomedical Research Program involves both grants and contracts to promote scientific research on tropical diseases of great importance to the health of people in developing and developed countries of the world.

Immediate aims are to improve means for diagnosing, treating, and controlling these diseases with the ultimate goal of disease prevention. For example, the U.S.-Japan Cooperative Medical Science Program has been in effect since 1965 providing an opportunity for American and Japanese scientists to cooperate in studying nine disease-related areas of importance to the health of the peoples of Asia.

An agreement between the U.S. and the Soviet Union was signed in 1977. Scientists collaborated in a broad program of research on influenza and other respiratory diseases. The development of antiviral substances—including interferon and its inducers—for treatment and prevention of influenza and other acute respiratory viral diseases is a major part of NIAID activities.

In September 1979, the International Collaboration in Infectious Diseases Research Program replaced the International Centers for Medical Research and Training which had been operational since 1960. Under the new program, research centers are established in tropical countries through multidisciplinary program project grants awarded to U.S. institutions, as well as individual international exploratory/developmental research grants awarded to support U.S. investigators who have a scientific collaborator in a foreign country. The program is designed to promote true collaboration and scientific exchange between U.S. scientists and overseas counterparts. Special attention is given to the six diseases of WHO's Special Programme for Research and Training in Tropical Diseases, although no disease of major health importance to a tropical country is excluded. Other

international activities include the NIAID-USAID Regional Project on the Epidemiology and Control of Vector-Borne Diseases in the Near East, carried out through research contracts with Ain Shams University (Cairo) and Hebrew University of Jerusalem to study malaria, leishmaniasis, and Rift Valley fever. NIAID also coordinates studies on the immunology of infectious diseases as part of the Indo-US Science and Technology Initiative signed by the President and the late Prime Minister Indira Gandhi.

Additional international research activities are conducted within the Institute's intramural program.

Immunology and the Allergic and Immunologic Diseases

This program focuses on the immune system as it functions in the maintenance of health and as it malfunctions in the production of disease. It encompasses both basic and clinical research.

Basic research is conducted under two segments: Immunology and Immunochemistry, and Genetics and Transplantation Biology. Clinical research is supported in two areas: asthma and allergic diseases, and clinical immunology and immunopathology. NIAID's approach integrates anatomy, physiology, cell biology, genetics, biochemistry, pathology, pharmacology, immunology, and immunochemistry.

Special emphasis has been given toward implementing recommendations made by two NIAID advisory committees, a Study Group on Immunology and a Task Force on Asthma and the Other Allergic Diseases.

Immunobiology and Immunochemistry

The biology and chemistry of the immune system and its products are the concerns of this program area. Immunobiologic studies focus on the origin, maturation, and interactions of the immune system's major cells, lymphokines, and other substances produced by these and other cells that mediate immune reactions. Studies include the mechanisms responsible for the induction and regulation of the immune response. Immunochemical research encompasses the delineation of the chemical structure and function of antigens and antibodies; the chemical basis of immunologic specificity; the regulation of immunoglobulin synthesis; and the mechanisms of antigen-antibody reactions.

Biology of the Immune System

Program project goals include the following:

- a complete understanding of the life history of immunocompetent cells,
- the delineation of genetic factors that determine the differentiation and functions of these cells, and
- the development of the capability to intervene and manipulate the immune system in health and in disease.

Resources for Basic Immunology

With the advent of monoclonal antibodies as powerful tools for the analysis and manipulation of the immune response, a need arose for the easier sharing of these reagents and for the securing of the cell lines producing the especially valuable ones against accidental loss. In response, a Hybridoma Cell Bank was established to acquire, characterize, maintain, and distribute hybridoma cell lines producing monoclonal antibodies of interest to investigators in immunology and infectious diseases.

Separately, conventional and monoclonal antibodies useful in studies on the polymorphic murine cell-surface antigens are also acquired and distributed.

Immunogenetics and Transplantation Immunology

Primary program goals are to clarify the organization and mechanisms of expression of the genes on which immune function depends; to characterize protein products of genes, including histocompatibility antigens; to determine how gene products condition responses to foreign antigens; and to develop regimens to facilitate engraftment of transplanted organs and tissues.

Support is provided through grants for basic studies on the molecular genetics of the immune system, its phylogeny and ontogeny; for investigations of the structure and function of histocompatibility antigens; and for clinical research on factors that affect the success of transplantation, including strategies of immunosuppression.

Support is also provided through grants for studies of the structure-function relationship between antigens of the major histocompatibility complex and various disease states.

Control of Graft Rejection

A fundamental objective is to stimulate development of interventions in the immune response to foreign tissues based on understanding the immune system's regulatory network. Research is supported:

- to better define the mode of action of immunosuppressants by examining their effects on the functionally distinct lymphocyte subsets,
- to develop reagents that permit better characterization of antigens, and
- to develop and evaluate new agents that will be safe and effective in immunomodulation.

Statistical Analysis of Data on Transplantation

To improve the outcomes in transplantation, the NIAID program—in collaboration with national and regional organizations that collect clinical data on transplant donors and recipients—performs statistical analysis of such data to identify risk factors or effective treatment. Information can then be used by clinicians to assist in selection of transplantation candidates and therapeutic strategies.

Identification and Acquisition of Reagents

Through contracts, NIAID continues to be a source of standard reagents to identify cell surface antigens both within and outside of the major histocompatibility complex, which plays a role in immune response.

The distribution of standard human reagents for research purposes, formerly a function of the NIAID Serum Bank, is now being implemented under a contract to the American Red Cross. NIAID works closely with the contractor to ensure:

- acquisition, characterization and distribution of tissue-typing reagents and,
- evaluation and improvement of tissue-typing methodologies.

The Institute also is a primary source of standard reagents for distribution and analyses for basic immunogenetic studies of murine transplantation antigens.

Program Projects in Transplantation

Three program projects in transportation, located at major transplant centers, are currently funded by NIAID. The centers carry out basic and clincial research pertinent to mechanisms of rejection, organ availability and preservation, and management of rejection. This special granting mechanism is designed to facilitate the rapid translation of basic immunologic discoveries into clincial use.

Asthma and Allergic Diseases

The cause, pathogenesis, diagnosis, prevention, and treatment of both naturally occurring and acquired allergic diseases are of program concern. Various types of allergic problems are currently under investigation: immediate type hypersensitivity and its disorders, including asthma, allergic rhinitis, atopic dermatitis, urticaria and angioedema; allergic reactions and disorders caused by insect bites and stings, foods, airborne allergens, and infectious agents; manifestations of delayed hypersensitivity and contact dermatitis; and the mechanisms of drug reactions and chemical sensitization. Studies also include structure of the antibody, particularly IgE, and the chemical mediators released by the interaction of antigen and antibody with target cells; the isolation and chemical characterization of the active fractions of allergenic agents; and therapy and prevention of allergic disorders and hypersensitivity reactions by immunotherapy with specific antigens or drugs.

Asthma and Allergic Disease Centers

A network of Asthma and Allergic Disease Centers, initiated in 1971 and numbering 14, represents an effort to integrate the basic concepts of immunology, genetics, biochemistry, and pharmacology into clinical investigations. This program encourages collaboration between basic and clinical scientists, provides a research environment favorable for such interactions, and implements clinical application of adequately tested research findings and procedures. It is believed that this will lead to an understanding of the pathophysiologic, biochemical, and immunologic mechanisms of asthma and allergic diseases.

NIAID also assists investigators by providing various purified allergens for use as standards or by supplying working quantities of unusually rare or expensive materials for research. Currently, these materials include hypersensitivity pneumonitis antigens and antiserum, purified grass and ragweed antigens, cat allergens, and the venoms of honeybees, yellow hornets, white-faced hornets, yellow jackets, and paper wasps.

Special Studies in Allergy

Five institutions are participating in a cooperative agreement to study the effectiveness of immunotherapy for adult asthmatics allergic to ragweed or house dust mites. The study will take 5 years to complete.

In 1985, a clinical trial of pharmacologic prophylaxis of anaphylactoid reactions to radiocontrast media will be initiated, and an evaluation of the role of immunotherapy in the treatment of animal allergy will be undertaken.

The problem of asthma and hypersensitivity lung reactions due to environmental and occuptional exposures has become increasingly important. Efforts are under way to foster and design investigative studies that will define pathogenic mechanisms and epidemiologic characteristics of such immunologic and toxic pulmonary disorders.

Research studies are also being undertaken in the underserved area of food allergy in order to improve diagnostic reagents and criteria and to determine possible relationships between foods, food additives, and specific allergic reactions.

Immunopathology and Immunologic Diseases

Research in this area investigates the underlying cellular and

molecular mechanisms responsibile for the pathogenesis of immunologic diseases, as well as the application of basic knowledge to the etiology, prevention, and management of immunologic disorders. These disorders include autoimmune, immune complex, and immunodeficiency diseases; immunoregulatory dysfunctions; the acquired immune deficiency syndrome; and immunodermatology.

Also included are studies of acute and chronic inflammation; cellular and soluble inflammatory mediators; anti-inflammatory agents; chemistry, activation and disorders of the complement system; and mechanisms of phagocyte activation and antimicrobial action of phagocytic cells.

In 1978, NIAID established four Centers for Interdisciplinary Research on Immunologic Diseases (CIRID) to accelerate clinical application of new knowledge on the immune system. Protocols were designed to favor integration and coordination of research projects in clinical immunology being pursued in other specialties (e.g., dermatology, pulmonary medicine, rheumatology, infectious diseases, and otorhinolaryngology) with those in basic research. Study of at least one allergic disease was a necessary component of each center's effort. Centers, recently increased to six, will be developing special projects and activities such as recruiting and training of clinical investigators, demonstration programs, assessing the regional socioeconomic impact of immunologic and allergic diseases, and continuing medical education of practicing physicians.

Office of Recombinant DNA Activities

The Office of Recombinant DNA Activities was transferred from the National Institute of General Medical Sciences to the NIAID in September 1979 to facilitate the administration of recombinant DNA activities supported and monitored by the NIH. Under NIAID, the office has continued a variety of efforts including the review of all special requests submitted to the NIH involving recombinant DNA technology as well as implementation of NIH policies and procedures for conducting this research.

NIH Guidelines for Research Involving Recombinant DNA Molecules continued to evolve as major actions were recommended by the Recombinant DNA Advisory Committee and were approved by the Director, NIH. Major revisions of the guidelines were in the *Federal Register* on November 23, 1984. The guidelines continue to be mandatory for institutions receiving NIH funding.

ORDA also publishes the *Recombinant DNA Technical Bulletin*, and NIAID continues to manage the NIH program to assess the risks of recombinant DNA research.

National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases*

Mission

The National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases conducts and supports research on many of the most serious diseases affecting the public health. The Institute supports much of the clinical research on the diseases of internal medicine and related subspecialty fields as well as many basic science disciplines.

The Institute's Division of Intramural Research conducts basic studies in endocrinology; genetics; chemistry; biochemistry; immunology; metabolism; physical, chemical, and molecular biology; chemical physics; pharmacology; and pathology. NIADDK scientists also guide clinical research and treatment programs on arthritis, diabetes and other metabolic diseases, cystic fibrosis, endocrine disorders, digestive diseases, kidney diseases, and blood disorders.

NIADDK extramural research is organized into five divisions: Arthritis, Musculoskeletal and Skin Diseases; Diabetes, Endocrinology and Metabolic Diseases; Digestive Diseases and Nutrition; Kidney, Urologic and Hematologic Diseases; and Extramural Activities.

The Institute supports basic and clinical research through investigator-initiated grants, program project and center grants, and career development and training awards. In addition, the Institute supports research and development projects and large-scale clinical trials through grants, contracts, and cooperative agreements.

Important Events in NIADDK History

August 15, 1950—President Harry S. Truman signed into law the Omnibus Medical Research Act establishing the National Institute of Arthritis and Metabolic Diseases in PHS. The new Institute incorporated the laboratories of the Experimental Biology and Medicine Institute and initiated plans for an expansion to include clinical investigation in the rheumatic diseases, diabetes, and a number of metabolic, endocrine and gastrointestinal diseases.

November 15, 1950—The National Advisory Arthritis and Metabolic Diseases Council held its first meeting and recommended approval of NIAMD's first grants.

*Until May 19, 1972, the National Institute of Arthritis and Metabolic Diseases; until June 23, 1981, the National Institute of Arthritis, Metabolism, and Digestive Diseases.

November 22, 1950—NIAMD was established by Surgeon General Scheele. Dr. W. H. Sebrell, Jr., was appointed the Institute's first Director.

March 6, 1951—Dr. Russell M. Wilder was appointed Director, succeeding Dr. Sebrell, who was appointed Director of NIH on October 1, 1950.

October 1, 1953—Dr. Floyd S. Doft was appointed NIAMD Director, succeeding Dr. Wilder.

August 12, 1954—Dr. DeWitt Stetten, Jr., was appointed director of intramural research, to guide the Institute's growing programs of fundamental research and clinical investigations.

April 1955—The Extramural Training Program was established. Training grants in its first year of operation totaled $250,000.

1959—Dr. Arthur Kornberg, former chief of the Institute's Enzyme and Metabolism Section, won the Nobel Prize for synthesizing nucleic acid.

The Institute initiated an intramural research program in gastroenterology and launched an intramural research program in cystic fibrosis with the establishment of the Pediatric Metabolism Branch.

1961—Laboratory-equipped, mobile trailer units began an epidemiological study of arthritis among the Blackfeet and Pima Indians in Montana and Arizona, respectively. This study led to the Institute's decision to establish permanent facilities in Phoenix, Ariz., for both epidemiological and clinical studies in Southwestern Indian populations.

November 23, 1962—Dr. G. Donald Whedon, assistant director, NIAMD, and chief of the Metabolic Diseases Branch, was appointed Director to succeed Dr. Doft.

December 13, 1962—Dr. Joseph E. Rall was appointed director of intramural research, to succeed Dr. Stetten, who left to head the new Rutgers University Medical School.

October 16, 1969—The Nobel Prize was awarded to Dr. Marshall W. Nirenberg of the National Heart Institute who reported his celebrated partial cracking of the genetic code while an NIAMD scientist (1957–1962).

November 1970—The Institute celebrated its 20th anniversary with a science writers' seminar and a banquet. Leaders in the Department, representatives from voluntary health agencies and professional biomedical associations, as well as past and present members of the Institute's National Advisory Council, heard an address by Secretary of Defense Melvin R. Laird, former chairman of the House subcommittee on HEW appropriations.

May 19, 1972—The Institute name was changed to the National Institute of Arthritis, Metabolism, and Digestive Diseases.

October 1972—Dr. Christian B. Anfinsen, chief of the Institute's Laboratory of Chemical Biology, shared a Nobel Prize with two other American scientists for his demonstration of one of the most important simplifying concepts of molecular biology, that the three-dimensional conformation of a native protein is determined by the chemistry of its amino acid sequence. A significant part of this research cited by the award was performed while with NIH.

September 1973—The Institute's diabetes centers program was initiated with the establishment of the first Diabetes-Endocrinology Research Centers (DERC's).

January 1974—A "memorandum of understanding" was signed with U.S.S.R. representatives to establish a cooperative arthritis research program.

Dr. Nancy B. Cummings was appointed associate director for kidney, urologic, and blood diseases to coordinate related Institute activities.

December 1974—Dr. Harold P. Roth was appointed associate director for digestive diseases and nutrition in order to direct an expanded program of research grants, contracts, training and fellowship awards for digestive diseases and nutrition. The associate director's post brought renewed emphasis to research in gastroenterology.

November 1975—After 9 months of investigation into the epidemiology and nature of diabetes mellitus and public hearings throughout the U.S., the National Commission on Diabetes delivered its report, the Long-Range Plan to Combat Diabetes, to Congress. Recommendations encompassed expansion and coordination of diabetes and related research programs; the creation of a diabetes research and training centers program; acceleration of efforts in diabetes health care, education, and control programs; and the establishment of a National Diabetes Advisory Board.

April 1976—After a year of study and public hearings, the National Commission on Arthritis and Related Musculoskeletal Diseases issued the *Arthritis Plan,* its report to Congress which called for increasing current arthritis research and training programs conducted by NIH; the creation of multipurpose arthritis centers throughout the country; the initiation of epidemiologic studies and data systems in arthritis; a National Arthritis Information Service; and establishment of a National Arthritis Advisory Board.

July 1976—Dr. Lawrence E. Shulman was appointed acting associate director for arthritis, bone and skin diseases, and special advisor to the Director,

NIAMDD, to coordinate Institute activities related to these disorders.

September 1976—Dr. Lester B. Salans was appointed associate director for diabetes, endocrinology and metabolic diseases, and special advisor to the Director, NIAMDD, to coordinate long-range plans to expand national research efforts against diabetes.

October 1976—The National Diabetes Advisory Board was established to review and evaluate the long-range plan recommended by the National Commission on Diabetes.

The National Arthritis Advisory Board was established to review and evaluate the implementation of the *Arthritis Plan* formulated by the National Commission on Arthritis and Related Musculoskeletal Diseases.

Dr. Baruch Blumberg was awarded the Nobel Prize in Physiology or Medicine for research on the hepatitis B virus protein—the "Australia antigen"—which he discovered in 1963 while at the Institute. This advance has proven to be a scientific and clinical landmark in detection and control of viral hepatitis and led to the development of preventive measures against hepatitis and liver cancer.

April 19, 1977—The Director, NIH, established a trans-NIH program for diabetes, with lead responsibility in NIAMDD.

September 1977—Over $5 million in grants was awarded to five institutions to establish Diabetes Research and Training Centers. Each center conducts research in diagnosis and treatment of diabetes mellitus and related endocrine and metabolic disorders, and conducts training and information programs for physicians and allied health personnel who provide primary care for diabetic patients.

October 1977—In response to the recommendation of the National Commission on Diabetes, the National Diabetes Data Group was established within the Institute to collect, analyze, and disseminate data on this disorder to scientific and public health policy and planning associations.

December 1977—Three scientists won the Nobel Prize for work supported partly by NIAMDD grants. Drs. Roger C. L. Guillemin and Andrew V. Schally were recognized for discoveries concerning peptide hormone production in the brain, and Dr. Rosalyn S. Yalow shared the prize for her work in the development of radioimmunoassays of peptide hormones.

September 1978—The National Diabetes Information Clearinghouse was administratively established as the central point for the collection and dissemination of information on sources of diabetes education materials and programs.

October 1978—The Arthritis Information Clearinghouse was established by the Institute to collect, screen, store, and disseminate information about education materials and programs available from all sources dealing with the rheumatic diseases.

December 1978—A 15-month study of cystic fibrosis focused on the need for future research activities, including increased support for clinical and basic research, expansion of specialized CF research resources, emphasis on training of scientific personnel, and coordination of public and private cystic fibrosis research activities. Prepared by the Cystic Fibrosis Foundation, *Cystic Fibrosis—State of the Art and Directions for Future Research Efforts,* was commissioned by the NIAMDD and the National Heart, Lung, and Blood Institute.

January 1979—Following 2 years of study and public hearings, the National Commission on Digestive Diseases issued its report, *The National Long-Range Plan To Combat Digestive Diseases.* Recommendations to Congress included the establishment of a National Digestive Diseases Advisory Board, an information clearinghouse, and increased emphasis on educational programs in digestive diseases in medical schools.

November 1979—Dr. Jesse Roth, chief of the Diabetes Branch of NIAMDD intramural research, was named the first winner of the Lita Annenberg Hazen Award for achievement in medical research and teaching.

December 1979—A task force completed its study and submitted the report, An Evaluation of Research Needs in Endocrinology and Metabolic Diseases.

June 1980—The National Digestive Diseases Information and Education Clearinghouse was established to identify, collect, analyze, and disseminate information about digestive diseases and to serve as a national education resource for patients and their families, physicians, and other health professionals.

September 1980—Dr. Rall, director of NIAMDD intramural research, became the first person at NIH to be named to the distinguished executive rank in the Senior Executive Service. The award was presented by President Carter in ceremonies at the White House on September 9, 1980.

October 15, 1980—NIAMDD celebrated its 30th anniversary with a symposium, DNA, the Cell Nucleus, and Genetic Disease, and a dinner at the National Naval Medical Center. Dr. Donald W. Seldin, chairman of the department of internal medicine, University of Texas Southwestern Medical School, Dallas, was guest speaker.

June 23, 1981—The Institute was renamed National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases.

October 1, 1981—Dr. Salans was appointed Acting Director, NIADDK, following the resignation of Dr. Whedon, who served as Institute Director for nearly 19 years.

April 1982—HHS Secretary Richard S. Schweiker elevated NIADDK's program clusters to Division status, creating five extramural divisions and the Division of Intramural Research. In so doing, NIADDK was converted to bureau status, joining the National Cancer Institute, the National Heart, Lung, and Blood Institute and the National Library of Medicine.

June 17, 1982—Dr. Salans was appointed Director of the Institute.

November 1982—Dr. Elizabeth Neufeld received a Lasker Foundation Award. She is cited, along with Dr. Roscoe E. Brady of NINCDS, for "significant and unique contributions to the fundamental understanding and diagnosis of a group of inherited diseases called mucopolysaccharide storage disorders (MPS)."

January 1983—Dr. Harold P. Roth was appointed director, Division of Digestive Diseases and Nutrition.

Dr. Lawrence E. Shulman was appointed director, Division of Arthritis, Musculoskeletal and Skin Diseases.

May 1983—Dr. James E. Balow was appointed acting director, Division of Kidney, Urologic and Hematologic Diseases succeeding Dr. Cummings who became associate director for research and assessment.

Dr. Jesse Roth was appointed director, Division of Intramural Research, succeeding Dr. Joseph E. Rall who was appointed NIH Deputy Director for Intramural Research.

December 1983—Dr. Pierre Renault was appointed NIADDK deputy director.

January 1984—Dr. Walter Stolz was appointed director, Division of Extramural Activities, succeeding Dr. George Brooks who retired in January 1983. Dr. Stolz was acting director since May 1983.

February 1984—Dr. Ernest W. Johnson was named director, Division of Diabetes, Endocrinology and Metabolic Diseases. He was acting director since May 1983.

July 1984—Dr. Pierre F. Renault was appointed Acting NIADDK Director. He replaced Dr. Salans, who became dean of Mt. Sinai School of Medicine.

October 1984—Dr. Gary E. Striker was named director, Division of Kidney, Urologic and Hematologic Diseases, succeeding Dr. Balow.

January 7, 1985—Dr. Mortimer B. Lipsett was appointed NIADDK Director.

NIADDK Legislative Chronology

December 11, 1947—Under section 202 of P.L. 78-410 the Experimental Biology and Medicine Institute was established, with Dr. W. H. Sebrell, Jr., as Director.

August 15, 1950—Public Law 81-629, the Omnibus Medical Research Act, authorized establishment of NIAMDD to ". . . conduct researches relating to the cause, prevention, and methods of diagnosis and treatment of arthritis and rheumatism and other metabolic diseases, to assist and foster such researches and other activities by public and private agencies, and promote the coordination of all such researches, and to provide training in matters relating to such diseases. . . ." Section 431 of this act also authorized the Surgeon General to establish a national advisory council.

May 19, 1972—President Nixon signed P.L. 92-305 to bring renewed emphasis to research in digestive diseases by changing the name of the Institute to the National Institute of Arthitis, Metabolism, and Digestive Diseases (NIAMDD) and by designating a Digestive Diseases Committee within the Institute's National Advisory Council.

July 23, 1974—Public Law 93-354, the National Diabetes Mellitus Research and Education Act, was signed. The National Commission on Diabetes, called for by this act, was chartered on September 17, 1974; members were appointed by the HEW Secretary. The act called for centers for research and training in diabetes and establishment of an intergovernmental diabetes coordinating committee, including NIAMDD and six other NIH Institutes.

January 1975—The National Arthritis Act of 1974 (P.L. 93-640) was signed into law to further research, education and training in the field of the connective tissue diseases. The mandated National Commission on Arthritis and Related Musculoskeletal Diseases, was appointed by the HEW Secretary June 2. The act required centers for research and training in arthritis and rheumatic diseases and the establishment of a data bank, as well as an overall plan to investigate the epidemiology, etiology, control and prevention of these disorders.

October 1976—P.L. 94-562, the Arthritis, Diabetes, and Digestive Diseases Amendments of 1976, established the National Diabetes Advisory Board charged with advising the Congress and the HEW Secretary on implementation of the Long-Range Plan to Combat Diabetes developed by the National Commission on Diabetes. The law also established the National Commission on Digestive

Diseases to deal with a wide range of problems, including investigation into the incidence, duration, mortality rates, and social and economic impact of digestive diseases.

The National Arthritis Advisory Board was established by the same law to review and evaluate the implementation of the *Arthritis Plan,* formulated by the Arthritis Act of 1974. The board advises and makes recommendations to Congress, HHS Secretary, and heads of Federal agencies with respect to the plan and guidelines, policies, and procedures of Federal programs relating to arthritis.

December 1980—Title II of the Health Programs Extension Act of 1980, P.L. 96-538, changed the Institute's name to the National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases. The act also established the National Digestive Diseases Advisory Board. The law gave authorization to the Diabetes Information Clearinghouse, the Diabetes Data Group, and the National Digestive Diseases Information and Education Clearinghouse. In addition, it reauthorized advisory boards for arthritis and diabetes research.

Biographical Sketches of NIADDK Directors

William Henry Sebrell, Jr., M.D.
Born in Portsmouth, Va., in 1901, Dr. Sebrell received his M.D. from the University of Virginia. He began his research career under Dr. Joseph Goldberger, famous for his identification of pellagra as a nutritional deficiency disease.

During World War II, he served as codirector of the National Nutrition Program. Among his accomplishments in the field of nutrition are recognition of the deficiency disease ariboflavinosis, and the discovery that cirrhosis of the liver in rats can be treated with dietary supplements. He also studied relationships between pantothenic acid deficiency and the adrenal glands and developed methods for producing and treating anemias in experimental animals.

Dr. Sebrell served as Director of the Experimental Biology and Medicine Institute from its inception until it was reorganized August 15, 1950, as NIAMD. On October 1, 1950, he was named Director of NIH, a post which he held until retirement on August 1, 1955.

Russell M. Wilder, M.D., Ph. D.
Dr. Wilder was born in Cincinnati in 1885 and graduated in 1907 from the University of Chicago, where he received his Ph. D. degree in 1912. He was awarded his M.D. by Rush Medical College, Chicago, also in 1912.

He became a member of the Mayo Clinic staff in 1919. From 1929 to 1931 he was professor and chairman of the department of medicine at the University of Chicago, after which he returned to the Mayo Clinic and Foundation where he became head of the department of medicine.

On March 6, 1951, Dr. Wilder became Director of NIAMD, but resigned because of ill health on June 30, 1953.

Internationally known for nutrition studies, he described the syndrome hypoglycemia, and pioneered new methods in the treatment of epilepsy. Among his most widely read publications are *A Primer for Diabetic Patients* and a medical textbook on diabetes and related diseases.

Dr. Wilder died on December 17, 1959.

Floyd S. Doft, Ph. D.
Born May 19, 1900, in Griswold, Iowa, Dr. Doft received his Ph. D. in 1926 from Yale University and was presented with the honorary doctor of science degree from Simpson College in Indianola, Iowa, where he received his undergraduate degree in 1921.

After teaching and engaging in research at Yale, Harvard, and the University of Rochester School of Medicine, he joined NIH in 1937. He served as director of laboratory research of the early Experimental Biology and Medicine Institute, and held the office of Director from October 1, 1953, until his retirement May 3, 1962. He died in 1978.

Dr. Doft contributed to the understanding of dietary deficiences causing anemia and cirrhosis of the liver. He pioneered in the study of folic acid, pantothenic acid, and B-complex vitamins, and developed many of the techniques necessary for germfree research.

G. Donald Whedon, M.D.
Born July 4, 1915, in Geneva, N.Y., Dr. Whedon received his A.B. from Hobart College in 1936 and his M.D. from the University of Rochester School of Medicine in 1941. He has also been awarded honorary doctor of science degrees from both institutions. He interned at the Mary Imogene Bassett Hospital, Cooperstown, N.Y., and was later associated with the Strong Memorial Hospital in Rochester, Cornell University Medical College, and New York Hospital.

After joining NIAMD in 1952 as chief of the Metabolic Diseases Branch, a post he retained until 1965, he was named assistant director of the Institute in 1956. On November 23, 1962, Surgeon General Luther L. Terry appointed Dr. Whedon to succeed Dr. Doft as Director.

Dr. Whedon was among those who assisted in the initial planning of program and research facilities for Institute clinical investigations. His medical research experience and interests include the metabolic and physiological aspects of

convalescence and immobilization, metabolism and respiratory physiology in paralytic poliomyelitis, osteoporosis, human energy metabolism, and space medicine.

He was a consultant to the Office of Life Sciences, NASA, and received its Exceptional Scientific Achievement Award. For several years, he was the chairman of NASA's Life Sciences Advisory Committee and a Space Program Advisory Council member.

Dr. Whedon resigned as NIADDK Director on September 30, 1981.

Lester B. Salans, M.D.
Born January 25, 1936, in Chicago Heights, Ill., Dr. Salans received his B.A. degree from the University of Michigan in 1957, and graduated cum laude from the University of Illinois College of Medicine in 1961. He interned at Stanford University Medical Center and performed residency at the same institution from 1962 to 1964. He became affiliated with the Rockefeller University in 1965 and was chief medical resident from 1967 to 1968.

For the next 8 years, he was director of the diabetes clinic and of the endocrinology clinic at Dartmouth Hitchcock Medical Center.

In September 1976, Dr. Salans joined NIADDK as associate director for diabetes, endocrinology and metabolic diseases. The following year, he assumed the additional position of chief of NIADDK's Laboratory of Cellular Metabolism and Obesity.

Dr. Salans was appointed Acting NIADDK Director on October 1, 1981, and Director on June 17, 1982. Author of over 50 papers on diabetes, metabolism and obesity, he is on the editorial board of the *American Journal of Physiology* and served as a reviewer for eight scientific journals.

In 1979, he was awarded the first annual Distinguished Public Service Award from the Juvenile Diabetes Foundation. In 1980, he received the NIH Director's Award for outstanding initiative and dedication in providing leadership to trans-NIH and other Federal diabetes activities.

Dr. Salans resigned on June 30, 1984, to become dean of Mt. Sinai School of Medicine.

Mortimer B. Lipsett, M.D.
Born February 20, 1921, in New York, N.Y., Dr. Lipsett received his A.B. from the University of California in 1943 and his M.D. from the University of Southern California in 1951. He interned at Los Angeles County Hospital and performed residency at Sawtelle Hospital, Veterans Administration in Los Angeles from 1952 to 1954. He has been associated with the University of California, Sloan-Kettering Institute, and Cornell University Medical College.

He joined NIH in 1957 and has served in various capacities since that time except for a 2-year tenure as director of the Cancer Center, Inc., in Cleveland from 1974 to 1976. From 1957 to 1970, he served in the National Cancer Institute's Endocrinology Branch as medical officer; assistant chief; head, Endocrinology Service; and branch chief. In 1970, he joined the National Institute of Child Health and Human Development in the dual role of associate scientific director of intramural research and chief, Reproduction Research Branch, posts he held until his resignation in 1974 to join the Cleveland Cancer Center. He returned to NIH in 1976 as Director, Clinical Center, where he remained until 1982. From 1982 to 1984, he served as NICHD Director.

Dr. Lipsett was appointed Director, NIADDK, on January 7, 1985, to succeed Dr. Salans. He served as secretary general of the International Society of Endocrinology and is a member of numerous other professional organizations, including the Endocrine Society, the American Society for Clinical Investigation, and the Association of American Physicians. He is the author or coauthor of nearly 280 scientific articles.

He has been the recipient of many honors and awards during his career. He was awarded the Alfred P. Sloan Ward for Cancer Research and the Distinguished Leadership Award of the Endocrine Society. He received the DHHS Distinguished Service Award (1981), the Senior Executive Service Meritorious Rank Award (1982), and the Distinguished Andrologist Award (1984). Most recently, he was Trans-Atlantic Lecturer at the Third Joint Meeting of the British Endocrine Societies, Edinburgh, Scotland.

NIADDK Programs

Division of Arthritis, Musculoskeletal and Skin Diseases
This division supports basic and clinical research on the causes, development, diagnosis and treatment of arthritis and other rheumatic diseases, numerous musculoskeletal diseases, and major skin diseases. The division leads the NIH Arthritis Coordinating Committee, as well as the Arthritis Interagency Coordinating Committee.

Rheumatic Diseases Branch. Basic investigations involve immunology, inflammation, infectious agents, genetic factors, purine metabolism, skeletal muscle structure and function, and the structure and function of the components of connective tissue. Diseases of research emphasis include rheumatoid arthritis, osteoarthritis, systemic lupus erythematosus, arthritis in children, spondylitis, scleroderma and other diffuse

connective tissue disorders, gout and pseudogout.

Musculoskeletal Diseases Branch. NIADDK-supported research projects in the musculoskeletal diseases field include studies on function, formation, structure, metabolism and biomechanics of bone. Research areas include osteoporosis and other metabolic diseases; joint replacement methods and materials; developmental disorders including scoliosis, bone immunology, and transplantation; inherited connective tissue disorders; back disorders; and exercise pathophysiology.

Skin Diseases Branch. NIADDK supports research on the structure, function, and physiology of skin as well as the causes and improved treatment of a wide variety of skin diseases including psoriasis, lupus, eczema, vitiligo, bullous skin diseases, acne, and ichthyosis.

NIADDK Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1954	$3,621	$3,379	$7,000
1955	4,390	3,880	8,270
1956	5,910	4,930	10,840
1957	10,290	5,595	15,885
1958	13,837	6,548	20,385
1959	23,421	7,794	31,215
1960	38,553	8,309	46,862
1961	50,882	10,318	61,200
1962	69,809	12,022	81,831
1963	90,011	13,377	103,388
1964	99,914	13,765	113,679
1965	97,905	15,145	113,050
1966	104,393	18,810	123,203
1967	113,621	22,066	135,687
1968	116,160	22,738	138,898
1969	117,953	25,934	143,888
1970	118,959	27,660	146,619
1971	109,670	28,669	138,339
1972	122,309	31,016	153,325
1973	134,522	32,794	167,316
1974	125,622	33,825	159,447
1975	136,011	37,503	173,514
1976	138,612	40,904	179,516
1977	170,944	48,656	219,600
1978	202,719	57,534	260,253
1979	238,199	64,568	302,767
1980	274,088	67,118	341,206
1981	300,943	68,519	369,462
1982	296,898	71,293	368,191
1983	335,566	77,926	413,492
1984	384,080	79,946	464,026

Multipurpose Arthritis Centers Program. Arthritis centers provide multidisciplinary coordinated approaches in research, education and community demonstrations to provide advances in combating arthritis and other musculoskeletal diseases. In response to the National Arthritis Act of 1974, and recommendations of the National Commission on Arthritis and Related Musculoskeletal Diseases, 15 centers were established by NIADDK in 1977. The following year saw continued funding of these geographically dispersed centers, and the funding of an additional nine.

Cooperative Systemic Studies in Rheumatic Diseases. The cooperative studies program, a consortium of 11 clinics, permits in-depth research on various rheumatic conditions—particularly low-prevalence diseases not amenable to study at one clinic. With the direction of a coordinating clinic at the University of Utah, current therapeutic problems are reviewed, and innovative approaches to the study and treatment of arthritis and related diseases are being performed in several clinical trials.

Arthritis Information Clearinghouse. The Arthritis Information Clearinghouse is a service designed to help health professionals identify print and audiovisual educational materials concerned with arthritis and related musculoskeletal diseases. The clearinghouse screens, collects and organizes information on arthritic conditions from a wide range of resources.

Arthritis Epidemiology and Data Systems Programs. The Epidemiology Program provides an administrative core for efforts to encourage epidemiologic research in the fields of arthritis and related musculoskeletal diseases. Epidemiologic studies of these diseases contribute knowledge related to the prevalence and economic and social burdens from these diseases studying their natural history, identifying risk factors, and investigating disease etiologies.

The Arthritis Data Systems Program fosters systematic acquisition, storage, retrieval, and analysis of information concerning the rheumatic diseases. Program effort is focused on assuring validity and comparability of data collected in separate institutions, and integrating data resources with data needs.

Division of Diabetes, Endocrinology and Metabolic Diseases

The DEMD division is responsible for extramural research and research training related to diabetes mellitus, endocrinology, and metabolic diseases including cystic fibrosis. In addition, DEMD has the lead for administration of the Trans-NIH Diabetes Program and for coordination of all federally supported diabetes-related activities. The division also administrates the Trans-NIH Cystic Fibrosis Program.

Diabetes Programs Branch

Diabetes Research Program. This program supports basic and clinical studies related to the etiology, pathogenesis, prevention, diagnosis, treatment, and cure of diabetes mellitus and its complications. Research includes studies related to nutrition, metabolic regulation, and hormone synthesis/secretion/action, with respect to the pathobiology of diabetes mellitus and its complications; studies of the genetic nature of diabetes and identification of special markers that characterize individuals predisposed to diabetes; and studies to assess immunological and infectious factors. The program supports investigations related to pancreas and islet transplantation, automated insulin delivery systems, and glucose sensors.

Diabetes Centers Program. Two types of awards are made: Diabetes-Endocrinology Research Centers (DERC's), exclusively oriented toward biomedical research goals, and the Diabetes Research and Training Centers (DRTC's), which include training and information transfer components in addition to research. The five DERC's and seven DRTC's integrate, coordinate, and foster interdisciplinary cooperation of investigators in diabetes and related endocrine and metabolic disorders. Both programs also provide limited funds for pilot and feasibility studies to encourage young investigators and new initiatives.

Clinical Trials Program. The primary initiative of this program is the design and support of a multicenter clinical trail to assess the relationship between blood glucose control and prevention or amelioration of the early vascular complications of insulin-dependent diabetes mellitus. During the past year, 22 centers throughout North America have participated in cooperative study to assess the feasibility of a full-scale randomized clinical trial.

Endocrine and Metabolic Diseases Program Branch

Endocrinology Research Program. Basic and clinical studies of normal and abnormal functions of the pituitary, thyroid, parathyroid, and adrenal glands, as well as other components of the endocrine system are supported. Studies involve the mode of action of hormones, their biosynthesis, secretion, and metabolism as well as their binding to protein carriers, and interactions with other hormones and metabolites.

The Hormone and Pituitary Program supported by NIADDK since 1963 is an important research resource. The program distributes hormones and their antisera to qualified investigators, thus providing standardized products for endocrinology research.

Metabolic Diseases Research Program. This program funds investigator-initiated research into enzymatic mechanisms, biological transport, and membrane structure as they relate to the etiology, pathogenesis, and treatment for acquired or inborn errors of metabolism. Also supported is research in normal and abnormal fat, amino acid, urea, pyrimidine, and purine metabolism; synthesis and biosynthesis of chemicals and proteins; and studies of protein structure.

Cystic Fibrosis Program. This program supports investigator-initiated research projects related to the metabolic aspects of cystic fibrosis, nutritional aspects of CF, and a variety of other CF-related topics including the development of methods for homozygote and heterozygote screening.

In addition, the program supports a cystic fibrosis research center as well as a mutant cell repository, which serves as a resource for scientists studying various aspects of CF.

Special Programs Branch

Manpower Development Program. This program offers a variety of training and career development awards for the full range of the division's research areas. These include national research service award fellowships and institutional training grants, research career development awards, clinical investigator awards, special emphasis research career awards, physician scientist awards, and several other types of special emphasis fellowships.

National Diabetes Data Group. The group collects, analyzes, and disseminates data on diabetes and its complications. The NDDG is initiating efforts to define the data needed to address scientific and public health issues in diabetes; foster and coordinate the collection of these data; promote the timely availability of reliable data; appropriately modify data reporting systems to identify and categorize the medical and socioeconomic impact of diabetes; and promote the standardization of data collection and terminology. The NDDG staff also works to stimulate new investigator-initiated research programs in diabetes epidemiology.

National Diabetes Information Clearinghouse. The clearinghouse collects and distributes information about education, scientific materials, programs, and resources relevant to diabetes. The goal is to act as a catalyst in assisting and enhancing various groups in the development and exchange of educational materials and other diabetes-related information. The NDIC staff also coordinates investigator-initiated research related to the behavioral and psychosocial aspects of diabetes and its complications.

Division of Digestive Diseases and Nutrition

This division administers investigator-initiated research and research training in fundamental and clinical studies of the normal functions of the digestive tract (esophagus, stomach, intestines), and changes associated with diseases of the liver, gallbladder, biliary tract, and exocrine pancreas. NIADDK also supports research in basic nutrition, nutritional requirements, trace minerals, dietary fiber, obesity, and clinical nutrition. The division leads the Digestive Diseases Interagency Coordinating Committee and actively participates in the NIH Nutrition Coordinating Committee.

Digestive Diseases Program Branch

Esophageal, Gastric and Colonic Diseases Program. This program

concerns the fundamental aspects of physiological and biochemical processes associated with diseases of the esophagus, stomach, and colon. Research encompasses the role of genetic factors in the pathogenesis of diseases; studies of the mechanisms responsible for protection against various types of tissue injury, tissue repair, and regeneration; formation, storage, metabolism of gastrointestinal hormones; factors that govern the functioning of the digestive tract and mechanisms producing disorders such as functional bowel diseases; and studies dealing with the naturally occurring rhythms of higher organisms.

Intestinal and Pancreatic Diseases Program. Both basic and clinical research on the normal function and the relevant diseases of the small intestine, exocrine pancreas, and salivary glands, as well as studies of the gastrointestinal hormones, are supported by this program. Emphasis is placed on research into the structure, function, and diseases of the small intestine, including digestion, secretion, malabsorption syndromes, absorption, celiac sprue, and diarrhea; exocrine pancreas, including pancreatic insufficiency, acute and chronic pancreatitis, and Zollinger-Ellison syndrome; and the salivary glands. General studies are conducted on gastrointestinal hormones including modes of action, metabolism, and secretion, and organ transplantation including storage and preservation.

Liver and Biliary Tract Diseases Program. NIADDK funds research on the normal function and the diseases of the liver and biliary tract. Examples include factors controlling the levels of cholesterol in bile including dietary, intestinal and hepatic mechanisms; cholesterol and pigment gallstone disease; metabolism of bilirubin and other biliary components; basic studies on hepatic regeneration; biochemical and immunologic mechanisms responsible for the persistence of liver diseases; factors leading to liver cell injury, fibrosis and death; and basic and applied studies on organ transplantation, including techniques of prevention and storage.

Special Emphasis Areas Program. This program is concerned with subjects in digestive diseases and nutrition that require special attention by the division for their development and management. For example, anorectal diseases and disorders are receiving special emphasis to encourage a research and research training grant base appropriate to the level of national anorectal health problems. Concerns include etiology, prevention and treatment of hemorrhoids, fistulae, fissures, primary inflammatory processes, mechanisms of continence, and congential abnormalities.

Nutrition Sciences Branch

Nutrition Program. This program supports basic, clinical and behavioral research and training directed to the improvement of human health. Priority areas include: human nutrition requirements, i.e., environmental and host factors that may affect requirements including nutrient imbalance, drugs, disease, stress and activity levels; physiological function of essential nutrients in health and disease with emphasis on amino acids, calcium, magnesium, trace elements and vitamins; and significance of proportion and amount of macronutrients (dietary proteins, fats and carbohydrates) in metabolism. Also studied are the health significance of dietary fiber; prevention and control of obesity including the relationship among genetic predisposition, induced metabolic change, and social, environmental, physiological and behavioral factors; supportive nutrition of hospitalized patients; and assessment of nutritional status and dietary intake.

Clinical Nutrition Research Units. NIH supports core grants for Clinical Nutrition Research Units that include an integrated array of research, education, and service activities oriented toward human nutrition in health and disease. Since 1979, NIADDK has awarded five core grants in this multi-Institute effort to create a focal point for clinical nutrition in biomedical institutions.

National Digestive Diseases Education and Information Clearinghouse. This information service is designed to coordinate a national effort to educate the public, patients and their families, physicians, and other health care providers. The clearinghouse distributes material about digestive health, and diseases, including information on symptoms, diagnois, treatment, and prevention.

Digestive Diseases Core Centers. Digestive diseases core centers were established to bring together basic and clinical research scientists to enhance the effectiveness of research being conducted in the field of digestive diseas . The nine research centers investigate the underlying causes, diagnoses, treatments, and prevention of digestive diseases.

Division of Kidney, Urologic and Hematologic Diseases

Investigators supported by NIADDK seek to understand underlying mechanisms of kidney, urologic, and blood diseases in order to develop methods of prevention, earlier diagnosis, and more effective treatment of the various renal, urinary tract, and blood disorders. The division participates in the NIH Coordinating Committee for Blood Related Activities, led by NHLBI.

Kidney and Urology Branch

Renal Physiology/Pathophysiology Program. This program supports research into immune mechanisms of kidney disease, including glomerulonephritis, interstitial nephritis, and lupus nephritis; effects of drugs, nephrotoxins, and environmental toxins on the kidney including analgesic "associated" nephropathy; mechanisms of diseases resulting in chronic renal failure such as diabetic nephropathy and polycystic renal disease; structure and function of the kidney including metabolism, transport, and fluid-electrolyte dynamics.

Urology/Urolithiasis Program. This program funds research on lower urinary tract physiology and pathophysiology including neuromuscular mechanisms, i.e., bladder dysfunction, dyssynergia, incontinence and vesicoureteral and renal reflux; urinary tract infection including bacterial adhesion, local immune response mechanisms, pyelonephritis and interstitial cystitis; benign prostatic hyperplasia-prostatitis including normal and abnormal growth, biochemistry, steroid receptors, and animal models.

Also studied are kidney stones and related disorders of divalent ion metabolism (magnesium, calcium and phosphorus) including diagnosis and treatment, physical chemistry, endocrinology, nutrition, biochemistry, transport mechanisms, calculi dissolution and epidemiology; obstructive uropathy; bed wetting; impotence; and conditions of the bladder, ureters, urethra, prostate, seminal vesicles and penis, testis and epididymis.

Chronic Renal Disease Program. This program supports research into causes, prevention, and treatment of end-stage kidney disease (ESRD) including hemodialysis, hemofiltration, peritoneal dialysis, continuous ambulatory peritoneal dialysis and complications of such therapies. Investigations encompass adjuvant therapies, the role of diet in ESRD therapy and development and evaluation of treatment methods; renal transplantation including immunology specific to renal transplantation, immunosuppressive therapies, medical/surgical complications of transplants and organ preservation; pathophysiology of chronic renal failure including ESRD complications; and systemic abnormalities such as bone disease, anemia, neurological, metabolic, endocrine, cardiovascular, and gastrointestinal dysfunction and biochemistry of uremia.

Hematology Branch

Basic, applied, and clinical research and training are supported within a broad area related to blood including hemoglobin structure and genetics; nutritional anemias of chronic diseases such as chronic renal failure and arthritis; Cooley's anemia; blood cell production; iron metabolism, transport, and storage; iron overload and deficiency; and white blood cell metabolism and function.

Iron Chelator Development. The Institute has provided long-term support for development of new iron chelating compounds for clinical use and to test their toxicity. The compounds are needed by patients with Cooley's anemia who face damaging and life-threatening effects of iron deposits in vital organs secondary to repeated therapeutic blood transfusions.

National Institute of Child Health and Human Development

Mission

The National Institute of Child Health and Human Development conducts and supports research on the reproductive, developmental and behavioral processes that determine the health of children, adults, families and populations. In pursuit of this mission, the NICHD administers a multidisciplinary program of research, research training and public information, nationally and within its own facilities, on population and on maternal, child and family health.

Institute programs are based on the concepts that adult health and well-being are determined in part by episodes early in life, that human development is continuous throughout life, and that reproductive processes and the management of fertility are of major concern, not only to the individual, but to society. The Institute supports research in the reproductive sciences to develop knowledge enabling men and women to regulate their fertility with methods that are safe, effective and acceptable to various population groups, and to overcome problems of infertility. In the population, social, and behavioral sciences, the purposes of Institute-sponsored research are to understand the causes and consequences of population change. Research for mothers, children, and families is designed to advance knowledge of fetal development, pregnancy, and birth; to identify the prerequisites of optimal growth through infancy, childhood, and adolescence; and to contribute to the prevention and treatment of mental retardation.

NICHD seeks to assure that every child has the opportunity to fulfill his or her potential for a healthy and productive adult life.

Important Events in NICHD History

January 12, 1961—The report of the Task Force on Health and Social Security called for

establishing, by administrative action of the Surgeon General, a National Institute of Child Health within the NIH.

January 30, 1961—The DHEW General Counsel declared that existing legislation (enacted in 1950) limited the creation of new Institutes to those focusing on a disease or group of diseases, and that new legislation would be required to establish the Institute called for in the task force report.

February 17, 1961—A Center for Research in Child Health was established by the Surgeon General in the Division of General Medical Sciences.

October 17, 1962—Public Law 87-838 authorized establishment of the NICHD.

November 1, 1962—Dr. Robert A. Aldrich was named consultant to the Center for Research in Child Health and Director-designate of the proposed new Institute.

January 30, 1963—Secretary of Health, Education, and Welfare Anthony J. Celebrezze approved establishment of the NICHD, with provision that the Center for Research in Child Health and the Center for Research in Aging (established in 1956) be transferred from the Division of General Medical Sciences to the new Institute.

May 14, 1963—Members of the National Advisory Child Health and Human Development Council were appointed by the Surgeon General.

November 14, 1963—The first meeting of the National Advisory Child Health and Human Development Council was held November 14–16.

July 8, 1965—Dr. Donald Harting became the Institute's second Director.

December 2, 1965—A major NICHD reorganization, approved by the Surgeon General, gave emphasis to four program areas: reproduction, growth and development, aging, and mental retardation. At the same time, significant additions were made to the intramural program with the transfer to the NICHD of the National Heart Institute's Gerontology Branch in Baltimore and the major part of the National Cancer Institute's Endocrinology Branch located in the Clinical Center.

October 9, 1966—Dr. Gerald D. LaVeck became the Institute's third Director.

April 18, 1967—A second reorganization of the NICHD approved by the Surgeon General acknowledged the Institute's intramural research programs by separating responsibility for intramural and extramural research and creating seven intramural laboratories: Gerontology Research Center (Baltimore); Developmental Biology Branch; Social and Behavioral Sciences Branch; Reproduction Research Branch; Laboratory of Biomedical Sciences; Behavioral Biology Branch; and Children's Diagnostic and Study Branch. The reorganization also brought the NICHD administrative structure into line with that of the other Institutes.

June 15, 1968—The $7.5 million, four-story Gerontology Research Center building located at and operated in cooperation with the Baltimore City Hospitals, Baltimore, Md., was officially opened.

August 9, 1968—The Center for Population Research was established by the DHEW Secretary within the NICHD. The center is responsible for a contract and grant program in population and reproduction research and has been designated by the President as the Federal agency primarily responsible for population research and training.

September 1, 1974—Dr. Norman Kretchmer became the Institute's fourth Director.

May 27, 1975—The Center for Research for Mothers and Children was established. It is the Federal Government's focal point for research and research training on the special health problems of mothers and children, with responsibility for increasing knowledge about pregnancy, infancy, childhood, adolescence and adulthood, and for administering grant and contract programs related to these areas.

June 30, 1975—The Adult Development and Aging Branch and the Gerontology Research Center, with their programs for support and conduct of research in the field of aging, were transferred from the NICHD to the new National Institute on Aging.

July 1, 1975—Congress endorsed the major research programs of the Center for Research for Mothers and Children, a mechanism initiated by Dr. Kretchmer to promote and support research in perinatal medicine in areas not sufficiently addressed. Such areas include maternal diabetes, premature labor, low birth weight infants, and developmental conditions contributing to sudden infant death syndrome.

July 1, 1982—Dr. Mortimer B. Lipsett became the Institute's fifth Director.

September 20, 1982—NICHD celebrated its 20th anniversary at the 58th meeting of the National Child Health Advisory Council. Dr. Robert A. Aldrich, the first NICHD Director, was a featured speaker.

Four former patients and their families who have benefited from medical advances resulting from NICHD-supported research also attended. Their case histories illustrated two decades of research progress in:

- prevention of mental retardation by early identification of certain metabolic disorders through routine screening of newborns;
- diagnosis and treatment of male infertility;
- diagnosis, treatment and reversal of precocious puberty; and
- management of multiple medical problems of infants born prematurely or of low birth weight.

NICHD Legislative Chronology

October 17, 1962—Public Law 87-838 authorized the Surgeon General, with approval of the Secretary, to "establish in the Public Health Service an institute for the conduct and support of research and training relating to maternal health, child health and human development, including research and training in the special health problems and requirements of mothers and children and in the basic sciences relating to the processes of human growth and development, including prenatal development."

October 31, 1963—Public Law 88-164 provided grants to help pay for constructing research centers on mental retardation and related disability. The NICHD remains closely associated with some 12 centers installed prior to June 30, 1967, when the authority expired.

December 24, 1970—Public Law 91-572 added Title X to the Public Health Service Act authorizing grants and contracts for research and research training in family planning and population problems. The authority was delegated by the Secretary of Health, Education and Welfare to the NICHD where the program is administered by the Center for Population Research.

April 22, 1974—Public Law 93-270 assigned to the HEW Secretary and ultimately to the NICHD the task of conducting research on sudden infant death syndrome and reporting on it to the Congress.

July 29, 1975—Title II of P.L. 94-63, the Family Planning and Population Research Act of 1975, amended Title X of the Public Health Service Act. Thereafter the PHS could conduct as well as support population research, and Title X became the sole authority for population research appropriations.

August 13, 1981—The Budget Reconciliation Act of 1981, P.L. 97-35, repealed Sections 1004(b)(1) and 1004(b)(2) of the Public Health Service Act. Authority for supporting research in human reproduction and the population sciences now derives from the broad provisions of Section 301 and 441 of the Public Health Service Act.

Biographical Sketches of NICHD Directors

Robert A. Aldrich, M.D.
Dr. Aldrich became the Institute's first Director on March 1, 1963, serving until October of the following year, when he returned to his academic post at the University of Washington. Born December 13, 1917, in Evanston, Ill., he received his undergraduate education at Amherst College, earning the B.A. degree (cum laude) in 1939. He received his M.D. from Northwestern University in 1944.

From 1944 to 1946 he served in the Navy Medical Corps. Prior to becoming NICHD Director, he was professor and chairman, department of pediatrics, University of Washington School of Medicine, from 1956 to 1963. Dr. Aldrich is certified by the National Board of Medical Examiners, American Board of Pediatrics and the Oregon Basic Science Examining Board. He is a diplomate of the American Board of Pediatrics, and a member of the American Medical Association, Endocrine Society, American Pediatrics Society, Society for Pediatric Research and American Association for the Advancement of Science.

Donald Harting, M.D.
Dr. Harting was appointed Institute Director on July 8, 1965. He had served as Acting Director (1964-65), and as assistant director of the Institute from its establishment in January 1963.

Commissioned in the Public Health Service in 1947, he retired from the service in 1966 to become director of the American Public Health Association's Family Planning Project supported by the Ford Foundation.

Born in 1922 in Wilmington, Del., Dr. Harting earned his B.S. degree from Harvard College in 1943, his M.D. from Harvard Medical School in 1946 and his M.P.H. degree from Johns Hopkins School of Public Health in 1950.

He is a member of the PHS Commissioned Officers' Association, the National Committee for Children and Youth, the American Medical Association and the American Association on Mental Deficiency.

Gerald D. LaVeck, M.D.
Dr. LaVeck was appointed NICHD Director October 9, 1966. He had served as director of the Institute's Mental Retardation Program from 1963 to 1966. In May 1966 he was appointed acting scientific director, serving in that capacity until January 1967.

Before coming to NIH, he headed the Crippled Children's Service, Washington State Department of Health (1962-63), was clinical director of the Ranier School, Buckley, Wash. (1958-62), and was clinical assistant and then associate professor of pediatrics,

University of Washington School of Medicine, Seattle (1960–63).

Born April 19, 1927, in Seattle, Dr. LaVeck earned his B.S. degree from the University of Washington in 1948 and his M.D. from the same university's School of Medicine in 1951. In April 1966, he received the DHEW Superior Service Award.

He resigned September 1, 1973.

Gilbert L. Woodside, Ph. D. (Acting)

Dr. Woodside became Acting Director of the Institute upon Dr. LaVeck's resignation and served in that capacity on several occasions. He came to the NICHD in 1964 and was associate director for extramural programs from 1967 to 1975. He was deputy director of the Institute from 1975 to 1978.

He was born in Curwensville, Pa., and received his graduate education at Harvard University. After receiving a Ph. D. in biology in 1936, he joined the faculty of the University of Massachusetts where he served as professor of biology, head of the department of zoology, dean of the Graduate School and finally provost.

Dr. Woodside retired from the Federal service on December 15, 1978.

Norman Kretchmer, M.D., Ph. D.

Dr. Kretchmer was appointed NICHD Director September 1, 1974. He had been Harold K. Faber professor of pediatrics at Stanford University, where he served on the university and hospital staffs since 1959.

He was born in New York City, January 20, 1923. He received his Ph. D. from the University of Minnesota in 1947 and his M.D. from State University of New York College of Medicine in 1952. His research interests are in developmental biochemistry and perinatal biology especially as they relate to nutrition and the ability of the individual to adapt to the environment.

Dr. Kretchmer has served as a consultant to the NIH and many other advisory bodies, both government and private. Among his professional awards and fellowships are the Borden Award from the American Academy of Pediatrics (1969), the Guggenheim Fellowship in Human Development (1973–74) and the PHS Superior Service Award (1977).

He left NICHD at the end of September 1981 to become professor of nutritional sciences at the University of California, Berkeley, and professor of obstetrics and pediatrics at the University of California, San Francisco.

Betty H. Pickett, Ph. D. (Acting)

Dr. Pickett, NICHD deputy director since 1979, became Acting Director of the Institute upon Dr. Kretchmer's resignation.

A native of Providence, R.I., she received her education at Brown University, earning a B.A. magna cum laude in 1945, an M.Sc. in 1947, and a Ph. D. in 1949 in the field of psychology. She then joined the faculty of the University of Minnesota, Duluth, pychology department, remaining there until 1951. After teaching at the Universities of Nebraska and Connecticut, she became a professional associate, psychological sciences, at the Smithsonian Institution in 1953.

Dr. Pickett came to NIH in 1958 as executive secretary for DRG study sections on the behavioral sciences and on experimental psychology, and in 1962 began her career with NIMH. She was deputy director, Division of Extramural Research Programs from 1968 to 1974, and named acting director in 1975, a position she held until 1977, when she became associate director for extramural and collaborative research, NIA.

NICHD Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1964	$32,800	$1,200	$34,000
1965	38,906	3,790	42,695
1966	49,725	5,299	55,024
1967	55,710	9,212	64,922
1968	56,795	11,826	68,621
1969	57,363	15,763	73,126
1970	59,135	18,057	77,192
1971	64,151	30,609	94,760
1972	78,356	38,477	116,833
1973	89,114	41,315	130,429
1974	87,955	42,309	130,254
1975	97,848	44,587	142,435
1976	95,518	40,886	136,404
1977	100,717	44,826	145,543
1978	115,471	50,919	166,390
1979	143,951	54,039	197,630
1980	149,052	59,901	208,953
1981	164,233	56,395	220,628
1982	167,221	59,088	226,309
1983	188,948	65,376	254,324
1984	208,511	67,535	276,046

Among the honors and awards she has received are the DHEW Superior Service Award (1972), the DHEW Distinguished Service Award (1975), and the Harold M. Hildreth Award (for distinguished contribution to psychology in the public service, 1979, American Psychological Association).

Dr. Pickett was elected a fellow, AAAS, and belongs to Society for Research in Child Development, the Academy of Behavioral Medicine, the American Psychological Association, the Psychonomic Society, and the Association of Women in Science.

She left NICHD on September 30, 1982, to become Director of DRR.

Mortimer B. Lipsett, M.D.

Dr. Lipsett, an internationally known expert in developmental endocrinology, was appointed NICHD Director, effective July 1, 1982. Formerly Director of the NIH Clinical Center since 1976, he was responsible for the integration into the center of the Ambulatory Care Research Facility. For his accomplishments in administration of the Clinical Center, he was

awarded the DHHS Distinguished Service Award in 1981.

He received his M.D. degree from the University of Southern California, and interned at Los Angeles County Hospital. After a residency at Sawtelle VA Hospital in Los Angeles, a postdoctoral USPHS fellowship at Sloan-Kettering Institute, New York, and a staff position there, he came to the NIH in 1957. Chief of the Endocrinology Branch, National Cancer Institute, from 1966 to 1970, he then joined the NICHD as associate scientific director and chief, Reproduction Research Branch.

In 1974, Dr. Lipsett left NIH to become director of Cancer Center, Inc., a cancer research, training, and patient care facility in Cleveland, Ohio, and professor of medicine at Case Western Reserve University.

Author of more than 250 scientific papers, he is a member of many national and international medical societies including the American Society for Clinical Investigation, the American Association of Physicians, and the Endocrine Society. He is a fellow of the American College of Physicians. He has been editor-in-chief of the *Journal of Clinical Endocrinology and Metabolism*, president of the Endocrine Society, and since 1976 has served as secretary-general of the International Society of Endocrinology.

In addition to the DHHS award, Dr. Lipsett has also received the Alfred P. Sloan Award for Cancer Research (1955), the DHEW Superior Service Honor Award (1969), the Distinguished Leadership Award of the Endocrine Society (1976), and the Senior Executive Service Meritorious Rank Award (1982).

Organization

The NICHD has four major components—the Center for Research for Mothers and Children and the Center for Population Research, both extramural progams supporting research through grants and contracts; the intramural research program conducted in the Institute's Bethesda, Md., laboratories; the Epidemiology and Biometry Research Program; and the Scientific Review Program.

Center for Research for Mothers and Children

The Center for Research for Mothers and Children (CRMC) supports research and research training in the biomedical and behavioral sciences. The work is designed to foster pregnancies and births that produce sound infants—infants who can grow to adulthood free of disease and disability. The CRMC has five branches.

The Endocrinology, Nutrition and Growth Branch supports research on the nutritional needs of pregnant women, fetuses, and children and on the interrelationships of nutrition, endocrinology, and growth and development. The branch also focuses on nutritional and hormonal aspects of growth and development, both the normal and abnormal biological development of the fetus and infant, and on the effects of perinatal conditions and events on development.

The Human Learning and Behavior Branch is concerned with the development of human behavior, from infancy, through childhood and adolescence, into early maturity. Studies are supported in developmental psychobiology, behavioral pediatrics, cognitive and communicative processes, social and affective development and health-related behaviors, as well as learning disabilities, dyslexia and language disorders.

The Mental Retardation and Developmental Disabilities Branch focuses on the etiology, pathogenesis, epidemiology, diagnosis, treatment and prevention of retardation and related disabilities, examining the biomedical, behavioral and social processes involved.

The Genetics and Teratology Branch develops and supports research and research training in the etiology of congenital malformations. The branch also examines gene transfer, the genetic basis of human development, and the development of the immune system.

The Pregnancy and Perinatology Branch studies research related to pregnancy and maternal health, embryonic development, fetal growth, and infant well-being. The branch also supports research on high-risk pregnancies, low birth weight, premature birth, perinatal pharmacology and toxicology, sudden infant death syndrome, exercise during pregnancy, and the impact of conditions and/or treatments during pregnancy such as antibiotics, analgesics, anesthetics, drug use and addiction, cigarette smoking, obesity and infections on the outcome of pregnancy.

Center for Population Research

The Center for Population Research (CPR) conducts the Federal Government's central effort in population research. Through grants and contracts, the center supports:

- Fundamental biomedical research on reproductive processes influencing human fertility and infertility
- Development of better methods for regulating fertility
- Evaluation of the safety and effectiveness of contraceptive methods now in use
- Behavioral and social science research on the reproductive motivation of individuals, and

the causes and consequences of population change.

There are four branches in the CPR.

The Reproductive Sciences Branch supports fundamental biomedical research and research training in reproductive biology relevant to problems of human fertility and infertility.

The Contraceptive Development Branch supports projects aimed at developing safe and effective methods for regulating fertility in both men and women.

The Contraceptive Evaluation Branch assesses the safety and efficacy of current contraceptive methods over both the short and long term.

The Demographic and Behavioral Sciences Branch supports studies on the social, psychological, economic and environmental factors governing population growth, and the impact of population changes on individuals, families and society.

Intramural Research Program

The intramural research program conducts fundamental and clinical research at the Clinical Center of the NIH and laboratories elsewhere in Bethesda, Md.

A limited number of research patients are admitted to the program's clinical research projects, under guidelines established by the Director of the Clinical Center. Patients must be referred by a physician.

The intramural program participates in NIH Staff Fellowship Programs and Research and Clinical Associate Programs, which permit a continuous exchange of scientists between the NIH and other research centers. The program contains 11 branches.

Fundamental Research

The Laboratory of Developmental Neurobiology studies cellular and molecular mechanisms that determine nervous system functions and figure importantly in brain development. Research undertaken with primates seeks to relate brain function to behavioral states.

The Laboratory of Molecular Genetics examines how genetic information is transferred and expressed in a wide variety of regulated biologic systems.

The Laboratory of Comparative Ethology investigates cognitive, social and motivational development. Research focuses on early environmental influences on development, and on the complex relationships prevailing between the organism and its environment.

The Laboratory of Developmental and Molecular Immunity conducts research into the age-related development of immunity. Emphasis has been paced on the study of pathogenic mechanisms, major histocompatibility and other antigenic molecules, and on the immunoregulatory mechanisms of the host.

The Laboratory of Theoretical and Physical Biology applies mathematical, statistical, and computer-based techniques to the analysis of complex clinical, biological, and pharmacological problems.

The Cell Biology and Metabolism Branch is directed toward clarifying developmental aspects of intracellular structure and function. The branch also conducts clinical research on the fundamental mechanisms and treatment of the genetic disorders of iron metabolism such as hemochromatosis to learn how the intracellular traffic of iron is normally controlled, and at what level iron metabolism is abnormally regulated in patients.

The Laboratory of Neurochemistry and Neuroimmunity uses molecular biology and immunology techniques in a cell biological context to study the biosynthesis, packaging, transport, and secretion of active neural peptides and proteins.

Clinical Research

The Developmental Pharmacology Branch studies genetic and molecular mechanisms underlying cellular response to drugs and environmental contaminants. Particular attention is given to how pharmacological agents figure in birth defects and other drug toxicities, cancer and genetic mutation.

The Endocrinology and Reproduction Research Branch conducts clinical studies of endocrine disorders and disturbances of reproduction in men and women, and fundamental research on endocrine and reproductive processes.

The Developmental Endocrinology Branch explores in particular the role the endocrine system plays in the biologic differentiation of man at the level of the cell, the organ and the organism.

Human Genetics Branch interests range from studies on the etiology, diagnosis and treatment of genetic and developmental disorders of young people to very basic studies on eukaryotic gene expression utilizing recombinant DNA methodology. Current research projects concern lipid and carbohydrate metabolism, the mucopolysaccharidoses, heritable disorders of the bone and connective tissue, lysosomal storage diseases (e.g., cystinosis), temperature-sensitive models of cellular differentiation, the genetics of alcohol-related syndromes, and the structure and function of human tRNA genes.

Epidemiology and Biometry Research Program

The Epidemiology and Biometry Research Program provides the

Institute with the skills of three disciplines: biostatistics, computer sciences, and epidemiology.

The Biometry Branch provides statistical analyses for intramural and extramural investigators and conducts research of its own in biometry and biostatistics. It also serves as the coordinating and data center for multi-institution clinical trials supported by the NICHD.

The Epidemiology Branch studies factors that favor or inhibit the occurrence of diseases and disorders in man with a view to identifying ways to prevent them by modifying environment or lifestyle. It also traces the incidence, frequency and distribution of a variety of health problems.

The Scientific Review Program (SRP) is responsible for a broad range of functions related to the review of research and training grant applications and research contract proposals. There are two branches in the SRP.

The Research Grants Review Branch provides policy direction and coordination for the planning and conduct of initial scientific and technical merit review within the Institute involving applications for various types of grants.

The Research Contracts Review Branch serves the same function for NICHD research and development contracts in the biomedical, clinical, and behavioral sciences.

National Institute of Dental Research

Mission

Conducts, fosters, and coordinates research into the causes, prevention, diagnosis and treatment of oral and dental diseases and conditions.

Conducts and supports basic research in biochemistry, microbiology, immunology, physiology, anatomy, histology, cell and molecular biology, genetics, pathology, bioengineering, and the social and behavioral sciences. Also conducts and supports extensive clinical, epidemiological and applied studies relevant to its categorical mission.

Cooperates and collaborates with numerous Federal and non-Federal groups engaged in basic, clinical, epidemiological and applied research pertinent to dental problems.

Supports applied research and development in relevant fields through contracts.

Provides grants-in-aid to universities, hospitals, other public or private nonprofit institutions, and to individuals for research training, fellowships and career development awards.

Provides consultation, necessary dental examinations, and treatment to research patients of other NIH Institutes having clinical care responsibilities.

Participates in the NIH graduate program which lists approximately 100 courses ranging from cultural anthropology to chemical quantum mechanics. Provides unique training opportunities and research experience for a limited number of dental clinical associates, clinical associates, research associates, and visiting scientists in a broad spectrum of scientific disciplines. Sponsors numerous seminars for associates and staff.

Conducts a comprehensive program of information on research progress for scientists and the public through regularly scheduled publications and through public communications media, exhibits, and films.

Maintains a continuous and frequent interchange of information among the various scientific disciplines engaged in dental research through conferences, symposia, and publication of proceedings.

Important Events in NIDR History

1931—PHS created a Dental Hygiene Unit at NIH and designated Dr. H. Trendley Dean as the first dental research worker. His primary function was to apply principles of epidemiology to a series of community studies on the oral disease known as mottled enamel. His research on fluoride showed not only its relation to mottled enamel, but also its influence on tooth decay.

1945—Following fluoridation of the water supply in Grand Rapids, Mich., annual examinations of children were begun to study the effects of fluoride on the development of dental caries.

1948—On June 24, P.L. 80–755, the National Dental Research Act, created NIDR and the National Advisory Dental Research Council. On September 16, the Institute was established and Dr. Dean was appointed Director.

1949—The first meeting of the National Advisory Dental Research Council was held on January 10. The Institute-supported grants program was initiated, and the first grants and fellowships were awarded.

1953—Dr. Francis A. Arnold, Jr., was appointed NIDR Director in April, succeeding Dr. Dean who retired from PHS.

1954—Results of the first 10 years of the Grand Rapids study firmly established water fluoridation as a safe, effective, and economical procedure for the control of dental caries.

On October 30 the first meeting of the Board of Scientific Counselors was held. This Board was established to provide advice to NIDR on matters of general policy, particularly from a long-range viewpoint, as they relate to the intramural program.

1958—The Laboratory of Biochemistry was established to

conduct research studies on the chemistry and structure of collagen, elastin and other proteins. President Eisenhower signed the appropriations bill which included provisions to finance the construction of a building for the Dental Institute.

1960—On September 21 the cornerstone was laid for the Dental Institute Building (Building 30) at NIH.

1961—On May 26, DHEW Secretary Abraham A. Ribicoff dedicated the new NIDR building.

1962—The first grant for a multidisciplinary study of cleft palate was awarded to the University of Pittsburgh Health Center.

1963—Fifteen years of scientific accomplishment by NIDR were cited by scientists, administrators and health educators June 14 in a special anniversary observance.

1966—Dr. Seymour J. Kreshover was appointed NIDR Director in March succeeding Dr. Arnold, who was appointed chief dental officer, PHS.

A major reorganization of the Institute's extramural programs was implemented to more adequately plan and support research and training programs designed to attack the major dental diseases and disorders—dental caries, periodontal disease, oral-facial anomalies, and biomaterials.

1967—An NIDR program of grant support was initiated for the development of several dental research institutes/centers in university environments.

This program was designed to utilize all of the appropriate resources of the parent universities to create ideal research and training environments, fostering interdisciplinary approaches to the complex problems of oral diseases and disorders.

1969—The Laboratory of Histology and Pathology was reorganized and named the Laboratory of Biological Structure. This laboratory conducts basic research on the structural and chemical organization of the hard and soft tissues of the oral cavity.

1971—The National Caries Program was launched utilizing funds specifically earmarked to accelerate development of preventive methods to reduce tooth decay.

1973—The Laboratory of Oral Medicine was established to conduct both clinical and laboratory research on the cause, prevention, and treatment of diseases of the soft tissue of the oral cavity.

On June 28–29, a scientific conference commemorating the Silver Anniversary of the National Institute of Dental Research was convened in Washington, D.C.

1974—To encompass the expanded research studies conducted by the Laboratory of Microbiology, the Laboratory of Microbiology and Immunology was established. Laboratory programs involve the role of host factors in periodontal diseases, autoimmune diseases and allergic disorders.

To emphasize anesthesia-analgesia dental problems, the NIDR reorganized its intramural program to form a Neurobiology and Anesthesiology Branch composed of the Neural Mechanism Section and the Anesthesiology Section. The branch collaborates closely with the extramural programs concerned with pain control and behavioral studies.

1975—Having already established the safety and efficacy of several caries preventive measures, the NIDR initiated selected school demonstration projects through its National Caries Program.

1976—Dr. David B. Scott was appointed NIDR Director on January 1.

1977—The Institute established its first two specialized clinical research centers in periodontal diseases.

In June, Dr. Marie U. Nylen was named director of intramural research, the first woman to hold such a position at NIH.

1978—NIDR sponsored its first consensus development conference, Dental Implants—Benefit and Risk, to examine available data, suggest future research, and draft guidelines for implant therapy.

1980—The Diagnostic Systems Branch was created to pursue research and development of noninvasive diagnostic techniques, and analysis of the functional development of the oral and pharyngeal region.

A Clinical Investigations and Patient Care Branch was established to emphasize the intimate association between the Institute's patient treatment and clinical dental research programs.

1982—The Laboratory of Biological Structure and the Laboratory of Biochemistry were replaced by the Laboratory of Oral Biology and Physiology and a Mineralized Tissue Research Branch. The Laboratory of Oral Biology and Physiology conducts research on the cell biology of secretory tissues and the chemical modification of proteins. Skeletal development, regulation, and disorders are under investigation in the Mineralized Tissue Research Branch.

1983—Dr. Harald Löe was appointed NIDR Director in January.

On March 21 the NIDR opened the first multidisciplinary pain clinic in the United States devoted exclusively to research. The clinic provides an opportunity for all NIH researchers and clinicians to pool their knowledge and exchange ideas about the pathophysiology and treatment of pain.

The Institute initiated an annual honorary lecture to recognize outstanding scientific accomplishment in basic and clinical research and to honor distinguished scientists who have made important contributions in areas of research directly related to the interests of the Dental Institute.

1984—NIDR inaugurated the Dentist Scientist Award Program designed to provide opportunities for dentists to develop into independent biomedical investigators in the oral health research field.

The Institute completed its Long-Range Research Plan FY 1985–89 entitled *Challenges for the Eighties.* Under the direction of NIDR Director Harald Löe, a coordinating committee prepared this 5-year plan and summary of progress in the oral sciences and in disease prevention, diagnosis and treatment. The document pinpoints 14 emphasis areas for NIDR's oral health research.

NIDR established three new specialized caries research centers in university environments to continue research investigations into the cause, treatment, and prevention of dental decay.

An NIDR reorganization disbanded the National Caries Program and created the Epidemiology and Oral Disease Prevention Program (EODPP). The EODPP is devoted to research on the etiology, incidence and prevalence of dental caries, periodontal diseases, and other oral diseases and disorders.

Also, a realignment of the administrative offices within the Office of the Director was completed. This realignment established the Office of Planning, Evaluation and Communications (OPEC) which is composed of four sections: Planning and Evaluation, Research Data and Management Information, Public Inquiries and Reports, and Health Promotion and Science Transfer.

OPEC directs and coordinates the Institute's scientific program planning and evaluation activities as well as the health promotion activities related to the biomedical research supported and carried out by the NIDR. This unit also disseminates information on NIDR's research programs and activities to the professional and lay public.

NIDR's annual lecture series was named for Dr. Seymour J. Kreshover, former Institute Director. The lecture, given each September at the NIH campus, is known as the Seymour J. Kreshover Lecture Award.

Dr. Marie Nylen, former NIDR director for intramural research, was named associate director for the Institute's Extramural Program.

NIDR Legislative Chronology

June 24, 1948—Public Law 80-755 established NIDR to conduct, support, and foster research investigations on the causes, treatment, and prevention of dental diseases and conditions.

August 1, 1958—The President signed a DHEW appropriation bill which included provisions to finance construction of laboratory facilities to house NIDR.

Biographical Sketches of NIDR Directors

H. Trendley Dean, D.D.S.
Dr. Dean was born in East St. Louis, Ill., on August 25, 1893. He received his D.D.S. degree in St. Louis in 1916.

A pioneer in dental research, he was internationally known as an authority on the relation of fluorides to dental health. He developed a method for quantitatively measuring dental fluorosis and demonstrated a significiant difference in dental decay in fluoride and nonfluoride areas.

Dr. Dean became an acting assistant dental surgeon in PHS in 1921, and held various posts until September 17, 1948, when he became Director of NIDR, a post he held until March 31, 1953.

During this time, he received the Gorgas Award of the Association of Military Surgeons, the John M. Goodell Prize of the American Water Works Association for his work in fluoridation, the Jarvis Medal, Lasker Award, Distinguished Service Award of the American Association of Public Health Dentists, and the Award of Merit from Georgetown University.

Francis A. Arnold, Jr., D.D.S.
Dr. Arnold joined the staff of the Dental Research Section of NIH in 1937, and served as assistant section chief from 1943 to 1948. He was associate director of NIDR from 1948 to 1953, when he became Director.

Born in Orville, Ohio, December 30, 1910, he received his B.S. from Western Reserve in 1932 and his D.D.S. degree from that university in 1934. After his internship at the U.S. Marine Hospital in Cleveland, Ohio, he was commissioned in the PHS in 1936.

A pioneer in study of fluorides and epidemiological studies of the effects of fluoridation, Dr. Arnold received an honorary Sc.D. degree from Western Reserve University, as well as the Callahan Award, the Gies Award, and the Dean Award.

He was appointed chief dental officer of PHS in February 1966. One year later he accepted the position of coordinator of research at the School of Dentistry, University of the Pacific, San Francisco, Calif.

Dr. Arnold died on December 1, 1967.

Seymour J. Kreshover, D.D.S., M.D., Ph. D.
Dr. Kreshover served as NIDR Director from 1966 until his retirement in 1975. For 10 years before his appointment as Director, he served as the Institute's associate director in charge of research.

Prior to receiving his PHS commission in 1956, he had been associated with the Medical College of Virginia as professor of oral pathology and diagnosis, director of dental research, and director of graduate and postgraduate studies. Earlier he held posts at the University of Illinois, the Yale University School of Medicine, and New York University. His research activities involved oral pathology and embryology, and congential malformations.

Dr. Kreshover received the D.D.S. degree from the University of Pennsylvania School of Dentistry in 1938; the Ph. D. degree in clinical medicine and pathology from Yale University in 1942, and the M.D. degree from New York University School of Medicine in 1949.

He was awarded honorary Sc.D. degrees from the University of Buffalo (1961), the University of Pennsylvania (1967), and Boston University (1969). Other honors have included the PHS Meritorious Service Medal (1965), the Alfred C. Fones (1970), the Henry Spenadel (1970), the Pierre Fauchard Awards (1972), and the DHEW Distinguished Service Medal (1972).

Clair L. Gardner, D.D.S. (Acting)
Dr. Gardner served as Acting Director, NIDR, from July 1 to December 31, 1975. He has held the position of the Institute's associate director for extramural programs since 1972, and had previously been deputy director, associate director for special programs, and program planning officer.

Born in Harding, S. Dak., he received his D.D.S. degree from the Loyola University of the South, New Orleans. In 1955, he entered the PHS and served his internship in Boston, Mass. Before joining the NIDR staff in 1962, he was area dental officer of the Indian Health Service, Aberdeen, S. Dak.

In 1972, Dr. Gardner was awarded the PHS Meritorious Service Medal and, in 1975, received the Massachusetts Dental Society's International Award for the Advancement of Dental Research.

David B. Scott, D.D.S.
Dr. Scott, former dean of the School of Dentistry, Case Western Reserve University, became NIDR Director on January 1, 1976. His acceptance of the position brought Dr. Scott back to the Institute he had served from 1944 to 1965.

He was born on May 8, 1919. He received his A.B. degree at Brown University, D.D.S. degree from the Baltimore College of Dental Surgery, University of Maryland, and M.S. degree from the University of Rochester.

Dr. Scott joined the staff of the Dental Research Section, Laboratory of Infectious Diseases, NIH, in 1944, and was one of the original 13 staff members of the National Institute of Dental Research when it was established in 1948. From 1956 to 1965 he served as chief of the Institute's Laboratory of Histology and Pathology.

In 1965 he joined the faculty of Western Reserve University as the Thomas J. Hill distinguished professor of physical biology in the School of Dentistry and held a joint appointment as professor of anatomy in the School of Medicine. In 1969, following the federation of the university with the Case Institute of Technology to form Case Western Reserve University, Dr. Scott became the dean of the School of Dentistry.

Internationally recognized for his research on the properties, structure, and development of calcified tissues, his honors include the International Association for Dental Research Award for basic research in mineralization, the Arthur S. Flemming Award, election to the American College of Dentists and to the International College of Dentists, and an honorary Sc. D. from the Medical and Dental College of New Jersey and the Université Louis Pasteur, Strasbourg, France.

Dr. Scott retired from Federal service on December 31, 1981.

John F. Goggins, D.D.S. (Acting)
Dr. Goggins served as Acting Director, NIDR, from January to December 1982. Since joining the

NIDR Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1950	$235	$1,545	$1,780
1951	271	1,683	1,954
1952	271	1,346	1,617
1953	271	1,379	1,650
1954	271	1,469	1,740
1955	521	1,469	1,990
1956	521	1,655	2,176
1957	3,700	2,326	6,026
1958	3,825	2,605	6,430
1959	4,500	2,920	7,420
1960	6,226	3,793	10,019
1961	10,088	5,412	15,500
1962	13,984	3,356	17,340
1963	17,525	3,674	21,199
1964	15,775	3,914	19,689
1965	15,303	4,780	20,083
1966	18,002	5,675	23,677
1967	22,215	6,093	28,308
1968	23,349	6,958	30,307
1969	22,859	7,124	29,983
1970	23,253	7,555	30,808
1971	22,932	12,508	35,440
1972	28,375	15,013	43,388
1973	31,599	15,392	46,991
1974	29,169	16,396	45,565
1975	32,458	17,406	49,864
1976	32,434	18,857	51,291
1977	33,834	21,739	55,573
1978	37,043	24,685	61,728
1979	40,774	24,439	65,213
1980	42,815	25,488	68,303
1981	46,[illegible]	[illegible]4,928	71,114
1982	47,[illegible]	24,846	71,983
1983	52,4[illegible]	26,875	79,292
1984	60,021	28,653	88,674

Institute in 1965 as a postdoctoral fellow, he successively held positions as staff scientist, chief of the Periodontal and Soft Tissue Diseases Program, associate director for collaborative research, and NIDR deputy director. He was commissioned in the PHS in 1966 and holds the rank of dental director.

Born in Flint, Mich., he received a D.D.S. in 1958 and an M.S. in pathology in 1965, both from Marquette University. His research interests include the chemistry of connective tissues, bones, and teeth.

Dr. Goggins is the recipient of the PHS Commendation Medal. He is a councilor of the American Association for Dental Research, and a member of the International Association for Dental Research and the American Association for the Advancement of Science, among other professional organizations.

Harald Löe, D.D.S., Dr. Odont. In January 1983, Dr. Löe, former dean of the University of Connecticut School of Dental Medicine, was sworn in as the fifth NIDR Director.

Born in Steinkjer, Norway, on July 19, 1926, he received both his doctor of dental surgery and doctor of odontology degrees from the University of Oslo. After entering into clinical practice and holding a part-time teaching position at the university, he became a Fulbright fellow at the University of Illinois in 1957. From 1959 to 1962, he was a research fellow and associate professor in the department of periodontology at the University of Oslo. He then joined the Royal Dental College in Aarhus, Denmark, as professor and chairman of the department of periodontology. He was a visiting professor at Hebrew University, Israel, during 1966–67, and was named associate dean and dean-elect of the Royal Dental College in 1971.

Prior to becoming dean of the University of Connecticut School of Dental Medicine in 1974, Dr. Löe served as director of the Dental Research Institute and professor at the University of Michigan.

Widely recognized for his contributions in the field of periodontology, he is the founding editor of the *Journal of Periodontal Research* and has published more than 200 scientific and editorial papers on epidemiology, etiology, experimental pathology, and prevention of dental diseases.

A fellow and honorary member of numerous professional organizations throughout the world, Dr. Löe is also a past president of the International Association for Dental Research.

Universities in five countries—Sweden, Denmark, Greece, Belgium, and the United States—have presented him with six honorary degrees. In addition, he has received such awards as the Alfred C. Fones Medal for Outstanding Achievement in the Interest of Humanity from the Connecticut State Dental Association, the Daniel F. Lynch Award from the Dental Society of Greater Waterbury, Conn., the International Association for Dental Research Award for Basic Research in Periodontology, the International Lecturer of the Year Award of the Academy of International Dental Studies, and the American Society of Preventive Dentistry International Award.

In 1972, Dr. Löe was honored by Her Majesty, the Queen of Denmark, and made a Knight of Danebrog.

Extramural Research and Special Programs

NIDR is the primary sponsor of dental research and research training in the U.S. Through its extramural program component and Epidemiology and Oral Disease Prevention Program, the Institute provides funds for biological research outside its intramural laboratories and clinics in Bethesda. These funds are made available in the form of grants and contracts which support scientists working in institutions throughout the United States and in foreign countries. These scientists carry out research ranging from laboratory studies on the basic causes of oral and dental diseases to clinical trials of new public health measures for prevention. Funds are also awarded to train new researchers in certain needed disciplines. The extramural program consists of a Scientific Review Branch, Grants Management Section, and three categorical program branches: Periodontal and Soft Tissue Diseases Research; Craniofacial Anomalies, Pain Control and Behaviorial Research; and Caries and Restorative Material Research. Extramural awards are made through these programs and through the Dental Research Centers Program. Brief descriptions are presented in the following paragraphs.

The Periodontal and Soft Tissue Diseases Research Branch supports research relating to the etiology, pathogenesis, diagnosis, treatment, and prevention of periodontal diseases. In addition, it supports studies on oral ulcerative and viral diseases, oral cancer, artificial dental implants, and the effects of nutritional variations on oral health. Special attention is given to the identification and characterization of microorganisms that cause periodontal diseases and to the host responses they evoke. Emphasis is placed on the biochemical and immunologic mechanisms involved in inflammation and tissue destruction, and on the

development of preventive, diagnostic and clinical treatment methods. The program also supports studies of the development, structure, function, and diseases of the salivary glands.

Craniofacial Anomalies, Pain Control and Behavioral Research Branch funds studies of normal and abnormal craniofacial growth, development, and function. Emphasis is placed on research pertaining to the etiology and treatment of craniofacial anomalies. Malocclusion as well as acquired disfigurement and dysfunction are also areas of concern. Investigations supported include treatment methods, developmental biology, wound healing, mastication, deglutition, speech, oral sensation and perception. This program supports basic studies of bone biology and research on technological developments in areas that relate to improved diagnostic techniques and treatment modalities including maxillofacial prostheses. In dental and orofacial pain conditions, the program funds studies in trigeminal neurophysiology, in addition to dental anesthesiology, intravenous sedation, trigeminal neuralgia, other facial pain syndromes, temporomandibular joint disorders, and bruxism. Also supported is research on orofacial sensory and motor dysfunction.

Behavioral and social science research includes factors influencing oral health status and the impact on the individual or oral diseases and disorders. Emphasized is research related to oral health promotion and prevention.

Caries and Restorative Materials Research Branch seeks to develop information on the epidemiology, etiology, pathogenesis, and treatment of dental caries to ultimately prevent tooth decay. Emphasis is placed on research to combat cariogenic organisms, increase host resistance to caries, alter potentially cariogenic dietary factors, and develop new and improved materials and techniques for treatment and prevention of diseases of the teeth, including disorders of the dental pulp. Research interests include mechanisms of infection by oral bacteria, biochemistry of plaque, the salivary immune system, physiochemistry of the caries process, mechanisms of caries inhibition by fluoride, and the relationship of diet to caries.

Restorative materials research attempts to improve adhesive sealants, amalgams, composites, cements, endodontic and intraoral prosthetic materials. Diagnostic and treatment instrumentation research and development are also included.

Scientific Review Branch coordinates initial review of applications for center research, small research, and conference grants; institutional and short-term training grants (NRSA); Physician Scientist Awards for Dentists and Dentist Scientist Awards (manpower development awards); and phase II awards of the Small Business Innovative Research Program. These reviews are carried out by a standing scientific advisory body, the NIDR Special Grants Review Committee, supplemented by ad hoc consultants, and by peer review groups especially convened for certain proposals.

Dental Research Centers

The NIDR supports 11 research centers. Five of these are the noncategorical Dental Research Centers initiated in 1967 at various universities. Ten years later, the Institute established two specialized clinical research centers for periodontal diseases. The following year, NIDR awarded a grant to establish a third periodontal program. The most recent initiative is the creation of three research centers to study dental caries. This network of dental research centers not only contributes new knowledge but also provides stimulating environments for training researchers and teachers. Much of the progress they have made has been achieved through collaboration by scientists from different centers.

Noncategorical Dental Research Centers are located at the Universities of Alabama, Michigan, North Carolina, Pennsylvania and Washington. They were established to broaden and strengthen the scientific base that underlies dental research by attracting basic scientists from a broad range of disciplines to cooperate in studies related to oral health.

The specialized centers for clinical research on periodontal diseases are located at Forsyth Dental Center in Boston, at the State University of New York at Buffalo, and at Virginia Commonwealth University in Richmond. In the span of 5 years, these centers have made significant progress on the microbiology and immunology of periodontal diseases.

Contracted Research Studies

NIDR's contracted research activities of the extramural, intramural, and the Epidemiology and Oral Disease Program fund research designed to readily translate advances in the basic sciences to disease-oriented applied research as well as to provide support complementary to laboratory studies. Emphasis centers on caries research and the development of new and improved restorative materials. Interagency agreements with other Federal agencies have also been utilized to provide support toward these targeted goals.

Epidemiology and Oral Disease Prevention Program

This program was inaugurated to address the need for expanded and updated information on oral conditions and to facilitate the rapid transfer and adoption of disease prevention and oral health promotion measures by the professional and lay public.

This program consists of two branches. The Epidemiology Branch conducts descriptive and analytical studies of the etiology, prevalence, and distribution of dental caries, periodontal diseases, and other oral diseases and disorders. The Disease Prevention Branch conducts laboratory, animal and clinical research for the purpose of testing agents and techniques that may prevent oral diseases. Research is supported both through intramural projects and research and development contracts.

Intramural Research Program

The Institute's intramural research program initiates and conducts basic and clinical research in areas of importance to NIDR's mission and provides dental service to selected patients of other Institutes. Intramural research encompasses eight laboratories and branches, a dental clinic, and a pain research unit at the NIH clinical center, each with responsibility for a specific program. Areas of concern include ecology, metabolism, and physiology of oral micro-organisms; role of host factors in periodontal disease; development, structure, composition, and metabolism of mineralized tissues; benign and malignant soft tissue lesions of the oral cavity; salivary gland structure and function, cogenital and acquired oral facial malformations, acute and chronic orofacial pain; and development and testing of improved and novel diagnostic methods.

Ongoing research continues to increase understanding of the formation, structure, and composition of normal and diseased teeth and bones. Special efforts are concerned with characterizing the organic matrices of mineralized tissues and defining their relative roles in initiating and controlling mineralization.

The biosynthesis, chemistry, and metabolism of tissue specific collagen, fibronectin, and proteoglycans—major components of most tissues and critical factors in oral tissue development, function and health—are studied with emphasis on their role in cell and tissue interactions during development, wound healing, and disease.

Studies of normal and abnormal development of orofacial structures are primarily directed toward understanding the formative processes at the biochemical level. Attempts are being made to determine the relative importance of environmental and genetic factors and to test in vitro new drugs and substances for teratogenic potential.

The complex interactions among microorganisms, host factors, and the oral environment are being explored, with emphasis on immune reactions in periodontal disease, genetic factors that affect host susceptibility, the role of bacterial plasmids in bacterial pathogenicity and antibiotic resistance, and plaque development.

Research into soft tissue diseases emphasizes the etiology and pathogenesis of oral aphthous ulcers, herpes simplex virus infections, as well as diseases of the salivary gland and pancreas. Studies of normal salivary gland function concentrate on cellular and biochemical mechanisms involved in production and secretion of saliva and on alterations in these processes occurring during normal aging and certain disease states.

Research on oral and facial pain focuses on determining pain and pain-suppression pathways. Researchers apply knowledge about pain mechanisms to clinical studies of acute and chronic pain and to determine the efficacy of drugs and other methods in pain control.

Experimental x-ray systems are being modeled to determine the quality and quantity of information required to facilitate early x-ray detection of tooth decay and periodontal disease. Another effort concerns the development of methods which improve diagnostic performance while at the same time minimize x-ray exposure.

National Institute of Environmental Health Sciences

Mission

NIEHS investigates the effects of chemical, physical, and biological environmental agents on human health. Its goal is disease prevention through programs that provide the scientific information base, advanced methodology, and trained manpower to understand and prevent adverse effects of environmental factors on human health.

The Institute supports training in environmental toxicology, pathology, mutagenesis, and epidemiology. The Institute also funds basic and applied research on the exposure of man and other biological systems to potentially toxic or harmful environmental agents.

In its research, NIEHS attempts to learn:

- The identification and characterization of potentially harmful environmental agents, particularly toxic chemicals;
- How they come to affect man by studying a variety of biological systems;

- What happens in biological systems after exposure to hazardous agents;
- What diseases are caused or aggravated by environmental factors;
- The extent of exposure of various population groups, especially sensitive populations, to these agents; and
- What effects these agents cause, by themselves and in combination with other environmental factors.

In rounding out these activities, NIEHS supports efforts to identify hazardous environmental agents before they are released into the environment. These include developing, testing, and validating biological assay systems to ascertain animal toxicity and to predict toxic effects which might occur in humans.

Program output is intended to aid those agencies and organizations, public and private, responsible for developing and instituting regulations, policies, and procedures to prevent and reduce the incidence of environmentally induced diseases.

Important Events in NIEHS History

June 27, 1958—"The advancement of Medical Research and Education," the Bayne-Jones Report, recommended the extension of research related to numerous environmental factors.

June 7, 1960—The study group on the PHS Mission and Organization final report stated that environmental health problems would require increased public and private effort, and predicted that a central laboratory facility would be needed.

January 1961—A proposal prepared by PHS recommended the establishment of an environmental health center.

November 1, 1961—The Committee on Environmental Health Problems recommended to PHS that a national center be established to undertake integrated research and other activities related to environmental health.

September 1964—Congress authorized planning funds for a central environmental health research facility.

January 7, 1965—The Surgeon General announced, following a site selection committee's recommendation, that Research Triangle Park in North Carolina would be the location of the National Environmental Health Sciences Center.

April 13, 1965—A group from the National Environmental Health Advisory Committee recommended to the Surgeon General that the proposed center be operated directly by PHS.

November 1, 1966—The Surgeon General announced the establishment of the Division of Environmental Health Sciences as a part of NIH.

September 26, 1967—The deed for 509.25 acres within Research Triangle Park, N.C., to serve as a permanent site for the Division of Environmental Health Sciences was presented to the Surgeon General.

January 12, 1969—The DHEW Secretary elevated the Division to an Institute—the National Institute of Environmental Health Sciences—designating Dr. Paul Kotin as Director.

March 1, 1971—Dr. David P. Rall was appointed NIEHS Director, replacing Dr. Kotin.

April 1972—The first edition of *Environmental Health Perspectives,* an NIEHS scientific journal, was issued.

February 1977—First construction contracts were let to begin the south campus facility of NIEHS in Research Triangle Park.

April 1977—Construction was begun on NIEHS' $65.7 million facility.

November 15, 1978—HEW Secretary Joseph A. Califano announced the establishment of the National Toxicology Program (NTP) under the direction of Dr. Rall, NIEHS Director.

October 4, 1979—First group of NIEHS employees moved to the support services center on the south campus.

April 4, 1981—Administrative offices in modules A and B of Building 101 were occupied.

July 14, 1981—DHHS Secretary Schweiker approved the reorganization of NIEHS. The bioassay program of the NCI Division of Cancer Cause and Prevention was transferred to NIEHS, and four program areas were established within the Institute: intramural research; extramural research; biometry and risk assessment; and toxicology research and testing.

October 5, 1981—The National Toxicology Program was made a permanent activity of DHHS.

November 15, 1982—Ceremonies were held to commemorate the dedication of the NIEHS permanent facility.

Biographical Sketches of NIEHS Directors

Paul Kotin, M.D.

Dr. Kotin was appointed Director of the Division of Environmental Health Sciences on November 1, 1966. Born in Chicago, Ill., on August 13, 1916, Dr. Kotin received his M.D. at the University of Illinois Medical School in 1940.

He joined PHS in 1962 and became chief of the Carcinogenesis

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Studies Branch, National Cancer Institute. In 1963 he was named associate director for field studies; and in 1966, scientific director for etiology, NCI.

Dr. Kotin left NIEHS in 1971.

David P. Rall, M.D., Ph. D.

Dr. Rall, appointed NIEHS Director on March 1, 1971, has extensive experience in comparative pharmacology, cancer chemotherapy, investigations of the blood-brain barrier, as well as the blood-cerebrospinal barrier, pesticide toxicology, and drug research and regulation. He has written or contributed to more than 100 articles published in the scientific literature, and he was instrumental in initiating the NIEHS journal, *Environmental Health Perspectives.*

He is chairman of the DHHS Committee to Coordinate Environmental and Related Programs; U.S. coordinator of the Environmental Health program under the U.S.-U.S.S.R. Health Exchange Agreement; and U.S. coordinator of the Biological and Genetic Consequences project under the U.S.-U.S.S.R. Environmental Protection Agreement. He is Director of the National Toxicology Program, a member of the National Academy of Sciences Institute of Medicine, a member of the board of directors for the North Carolina Academy of Sciences, and chairman of the Program Advisory Committee of the World Health Organization's International Program on Chemical Safety.

Dr. Rall has received the PHS Meritorious Service Award and the DHEW Distinguished Service Medal.

Born in Aurora, Ill., on August 3, 1926, he received his M.D. and Ph. D. degrees at Northwestern University in 1951. After serving as an intern on the Second (Cornell) Medical Division at Bellevue Hospital from 1952 until 1953, he joined the PHS and was assigned to the National Cancer Institute.

At NCI, Dr. Rall was head of the Clinical Pharmacology and Experimental Therapeutics Service of the General Medical Branch; chief of the Laboratory of Chemical Pharmacology; and associate scientific director for experimental therapeutics—a position he held until his appointment as NIEHS Director.

He has also served on the NIH Chemotherapy Study Section from 1965 to 1967 and was chairman of the Pharmacology-Toxicology Review Committee from 1967 to 1969. During 1970 he chaired the DHEW Departmental Committee on Drug Research and Regulation, and from 1971 until 1972 he was chairman of the OST-CEQ Ad Hoc Committee on Environmental Health Research. From 1975 through 1977 he was a member of the DHEW Committee on New Drug Regulation.

Dr. Rall is adjunct professor of pharmacology at the University of North Carolina.

Major Programs

Protecting the general health of Americans and preventing environmentally related diseases are recognized government responsibilities. The NIEHS through its research programs is providing a health science base for prevention and control activities. In doing this, the Institute focuses not on specific body organs or diseases but on agents and processes—the ways and means through which man's health can be adversely affected by chemical and physical agents in the environment.

Population expansion and growth of technology have increased environmental contamination problems. New forms of energy production, expanded uses of plastics and aerosols, and greater development of the chemical industry pose the problem of releasing toxic chemicals into the environment. Recent experiences with asbestos, mercury, vinyl chloride, bischloromethyl ether, methyl butyl ketone, sulfuric acid mist, polychlorinated and polybrominated biphenyls, kepone, dioxins, and chlorophenol indicate these compounds are not theoretical threats but real causes of illness and death.

NIEHS Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1967	$10,389	$2,841	[1] $24,298
1968	13,166	4,123	17,289
1969	12,498	6,321	17,820
1970	12,232	6,096	18,328
1971	13,099	7,521	20,620
1972	16,131	10,305	26,436
1973	19,728	11,228	[2] 30,956
1974	17,613	11,266	28,879
1975	20,877	14,072	34,949
1976	20,908	16,752	37,660
1977	28,878	21,263	51,141
1978	37,120	27,121	64,241
1979	43,415	34,665	78,080
1980	45,751	38,142	83,893
1981	49,990	43,501	93,491
1982	50,035	56,235	106,270
1983	60,747	104,120	164,867
1984	68,883	111,714	180,597

[1] Includes transfer of $11,068,000 to Bureau of Disease Prevention and Environmental Control.
[2] No appropriation available. This figure is the amount authorized.

The Institute is organized into four program areas: extramural, intramural, toxicology research and testing, and biometry and risk assessment.

The Extramural Program supports investigators at colleges universities, and research foundations through individual research grants, program project grants and other support mechanisms. These research activities provide information essential to an understanding of the way in which human health is adversely affected by chemical, physical and other environmental factors. The breadth of the Institute's mission dictates a multidisciplinary approach to

problem solving which involves major biological, chemical, and physical science disciplines.

The program developes priorities and funding levels to assure maximum utilization of available resources. It maintains an awareness of national research efforts and assesses the need for research and research training in environmental health and provides advisory support to the Institute in the development of the research grant policy. Through this program, the Institute supports basic and applied research on the consequences of the exposure of man and other biological systems to potentially toxic or harmful agents in the environment.

For administrative purposes, the research is divided into: 1) characterization of environmental health hazards; 2) biological response to environmental health hazards; 3) applied toxicological research and testing; 4) biometry and risk estimation; 5) resource and manpower development. Research and training may span one, several, or all program areas.

Training Program. The extramural training program supports pre- and postdoctoral training through institutional awards, and postdoctoral training through individual fellowships. The goal is to train individuals for careers generating knowledge in the biomedical aspects of environmental health sciences. Through research, these scientists will promote better comprehension of current and potential hazards to man from exposure to environmental agents.

Environmental Health Sciences Centers. These centers provide core support to facilitate multidisciplinary research in environmental health problems. They fill critical needs in the national environmental health program that cannot be met by individual research grants or program project grants. Each center has a different thrust and problem orientation. Overall, they serve as national focal points and resources for research and manpower development in health problems related to air, water and food pollution; occupational and industrial neighborhood health and safety; heavy metal toxicity; agricultural chemical hazards; and the relationships of environment to cancer, birth defects, behavioral anomalies, respiratory and cardiovascular diseases, and diseases of other organs.

Much of the research conducted by the centers, in addition to substantive contributions to preventive medicine, has served to clarify the scope of environmental health problems and future needs in this field.

Marine and Freshwater Biomedical Centers. MFB centers provide core support to foster multidisciplinary research on marine and freshwater organisms in the study of mechanisms of toxicity of environmental agents, and as models for human diseases and disorders resulting from exposure to environmental toxicants. Marine and freshwater research is a vital component of the broadscaled study of the health effects of the environment.

Research Manpower Development Programs. Institute research manpower development programs support training in toxicology, pathology, mutagenesis, and epidemiology and biostatistics as they pertain to the environment. Three mechanisms are used to fund training: 1) institutional awards for pre- and postdoctoral trainees (training programs), 2) individual awards for postdoctoral fellows only (fellowship awards), and 3) senior fellowship awards.

The Intramural Research Program conducts fundamental environmental research at the Institute's laboratories located primarily at Research Triangle Park. This research encompasses pharmacology, chemistry, genetics, reproductive and developmental toxicology, pulmonary function and toxicology, biophysics, and behavioral and neurological toxicology. The program evaluates the Institute's in-house research effort, establishes priorities, allocates funds, space, and personnel and integrates ongoing and new research activities into the overall program structure.

The Toxicology Research and Testing Program (TRTP) has two responsibilities critical to NIEHS's contribution to preventing chemically induced diseases. The first is to use established and innovative methods to test chemicals that have a high priority because of scientific or public health concerns. Although these methods may be cumbersome, time-consuming, expensive, and difficult to interpret they remain the best tools currently available for determining the toxic effects of chemicals to which people are exposed.

The second TRTP role—more important in the long run than the first—is to develop and validate more precise and, ultimately, less expensive methods for determining toxic effects. Both the testing and test methods development elements of TRTP are aimed at developing a more comprehensive understanding of the complex interactions between chemicals and the human organism.

TRTP activities represent the NIEHS contribution to the Department's National Toxicology Program (NTP). Established in 1978, NTP is a cooperative DHHS effort to develop the scientific information necessary to protect the American people from exposure to toxic chemicals. Resources for the program are provided by the National Institutes of Health/NIEHS, the Food and Drug Administration/National Center for Toxicological Research,

and the Centers for Disease Control/National Institute for Occupational Safety and Health. NTP results are distributed to government research and regulatory agencies; industry, labor, and environmental groups; and scientific community; and the general public.

The Biometry and Risk Assessment Program (BRAP) plans and conducts basic and applied environmental health oriented research in the areas of risk assessment, biomathematics, statistics, epidemiology, and biochemical applications to epidemiology and risk assessment, and collaborates with scientists involved in the TRTP, assuming responsibility for data management and statistical analysis. The TRTP collaborates with the Intramural Research Program on problems of molecular epidemiology. It also provides statistical, mathematical, data processing, and computer engineering support to other programs of the Institute; and assists the Office of the Director ir addressing specific health issues that bear on the welfare of the general public.

National Institute of General Medical Sciences

Mission

NIGMS supports research and research training in the sciences basic to medicine that form the foundation needed to make advances in understanding disease. In this way, the Institute helps supply new knowledge, theories, and concepts for disease-targeted studies supported by other NIH components.

NIGMS has five main program areas. Four—Cellular and Molecular Basis of Disease, Genetics, Pharmacological Sciences, and Biophysics and Physiological Sciences—fund grants for research projects and research training. The fifth, Minority Access to Research Careers, aims to increase the number and capabilities of minority individuals engaged in biomedical research and teaching by funding research training at colleges and universities with substantial minority enrollments. Interprogram coordination is stressed since projects and developments in one program frequently are relevant and of consequence to others. The Institute fosters multidisciplinary approaches to research and employs the full range of support mechanisms—research project grants, program-project grants, research center grants, research career development awards, new investigator research awards, and institutional and individual fellowships.

As a vital part of NIGMS' mission, the Institute funds two-thirds of all predoctoral research training supported by NIH as well as a sizable number of NIH postdoctoral research programs. In all of its research training programs, as in its research interest areas, NIGMS stresses the importance of laying the basic groundwork for disease-oriented research as well as for further fundamental biomedical studies.

Important Events in NIGMS History

July 16, 1958—The Secretary, DHEW, approved establishment of the Division of General Medical Sciences, with Dr. G. Halsey Hunt as chief.

October 17, 1962—Congress authorized establishment of the National Institute of General Medical Sciences.

January 30, 1963—The Secretary, DHEW, approved establishment of NIGMS, with Dr. Clinton C. Powell as Institute Director.

October 8, 1963—The National Advisory General Medical Sciences Council was established.

August 1, 1964—Dr. Frederick L. Stone was named Institute Director.

October 1, 1970—Dr. DeWitt Stetten, Jr., became Institute Director.

September 1, 1974—Dr. Ruth L. Kirschstein was appointed Institute Director.

October 13, 1982—NIGMS celebrated its 20th anniversary by establishing the DeWitt Stetten, Jr., Lectureship. Dr. David S. Hogness, Stanford University, gave the first lecture.

NIGMS Legislative Chronology

October 17, 1962—Public Law 87-838 authorized the Surgeon General to establish an Institute to conduct and support research and research training in the general or basic medical sciences and in related natural or behavioral sciences that have significance for two or more other Institutes of NIH, or that lie outside the general areas of responsibility of any other Institute.

Biographical Sketches of NIGMS Directors

G. Halsey Hunt, M.D.
Dr. Hunt, first chief of the Division of General Medical Sciences, was born in Newton, Mass., and received his M.D. from Columbia University in 1928.

Commissioned in the Public Health Service in 1936, he was named assistant chief of the Division of Hospitals in 1947 and chief of the division in 1949. In 1952 he was named Assistant Surgeon General and associate chief of the Bureau of Medical Services, and in 1956 he was assigned to NIH, where he became the first director of the Center for Aging Research.

On July 16, 1958, Dr. Hunt was named chief of the newly established Division of General Medical Sciences. In April 1962, he retired from the Public Health Service to become executive director of the Educational Council for Foreign Medical Graduates.

He died on February 2, 1980.

Clinton C. Powell, M.D.
Dr. Powell became first Director of the National Institute of General Medical Sciences when the former Division of General Medical Sciences was elevated to Institute status.

A native of Hartford, Conn., he received his M.D. from Boston University in 1944 and was commissioned in the Public Health Service in 1946. In 1954 he came to NIH, where he served successively in the Clinical Center, the National Cancer Institute, and the Division of Research Grants, eventually becoming deputy chief of the Division. In 1961 he was named assistant director of the National Institute of Allergy and Infectious Diseases, and in July 1962 he was appointed chief of the Division of General Medical Sciences, becoming Director of the new Institute on January 30, 1963.

In July 1964, Dr. Powell retired from government service to become associate coordinator of medical and health sciences at the University of California.

Frederick L. Stone, Ph. D.
Dr. Stone, second NIGMS Director, was born in Biloxi, Miss. He received his Ph.D. degree from the University of Rochester in 1948 and was commissioned in the Public Health Service that same year.

At NIH he served first as chief of the Research Fellowship Branch, Division of Research Grants, then as chief of extramural programs, National Institute of Neurological Diseases and Blindness. Following 2 years with the National Multiple Sclerosis Society and the University of Pittsburgh, he returned to NIH in 1956 as assistant to the associate director.

In 1957, Dr. Stone became assistant chief of the Division of Research Grants and chief of that Division's Research Training Branch. In 1962 he served briefly as acting chief of the Division of General Medical Sciences, then was named chief of the new Division of Research Facilities and Resources. Appointed NIGMS Director on August 1, 1964, he concurrently held the post of acting chief of the Division of Research Facilities and Resources through June 1965.

In April 1970, Dr. Stone left NIGMS to become president of New York Medical College.

DeWitt Stetten, Jr., M.D., Ph.D.
Dr. Stetten, a native of New York City, received both his M.D. (1934) and Ph.D. (1940) degrees from Columbia University. Following residency training, he served as assistant, instructor, then assistant professor of biochemistry at Columbia. In 1947 he was appointed assistant professor in biological chemistry at Harvard Medical School, and from 1948 to 1954 he served as chief of the division of nutrition and physiology at New York City's Public Health Research Institute.

In 1954 he came to NIH, where he directed intramural basic and clinical research programs for the National Institute of Arthritis and Metabolic Diseases. In 1962 he became dean of the newly established Rutgers Medical School.

Dr. Stetten returned to NIH as Director of NIGMS on October 1, 1970. In 1974 he became NIH Deputy Director for Science, and in September 1979 he was named Senior Scientific Advisor to the NIH Director.

Ruth L. Kirschstein, M.D.
Dr. Kirschstein was appointed Director of NIGMS on September 1, 1974.

A native of Brooklyn, N.Y., she received her B.A. degree in 1947 from Long Island University and her M.D. in 1951 from Tulane University School of Medicine. She served an internship in medicine and surgery at Kings County Hospital, Brooklyn, and residencies in pathology at Providence Hospital, Detroit; Tulane University School of Medicine; and the Clinical Center, NIH.

From 1955 to 1972, Dr. Kirschstein performed research in experimental pathology at the Division of Biologics Standards. During that time, she helped develop and refine tests of live poliovirus vaccines in monkeys—work that led to selection of the Sabin vaccine for public use. For her role in this work, she received the DHEW Superior Service Award in 1971.

In 1972 she became assistant director of the Division of Biologics Standards. That same year, when the Division was transferred to the Food and Drug Administration as a Bureau, Dr. Kirschstein was appointed deputy director. She subsequently served as deputy associate commissioner for science, FDA, before being named NIGMS Director.

Dr. Kirschstein has twice taken part in World Health Organization deliberations in Geneva, Switzerland, in 1965 as a member of the WHO Expert Group on International Requirements for Biological Substances, and in 1967 as a consultant concerning problems related to the use of live poliovirus oral vaccine.

She has received many honors and awards, including the PHS Superior Service Award, 1978; the Presidential Meritorious Executive Award, 1980; election to the

Institute of Medicine, 1982; the PHS Equal Opportunity Achievement Award, 1983; and a doctor of science, *honoris causa*, degree from Mt. Sinai School of Medicine, 1984.

She is the author of more than 70 scientific papers in the fields of viral pathology, viral oncology, and the pathogenesis of infectious diseases.

NIGMS Appropriations—Grants and Direct Operations[1]

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1967	$138,314	$6,799	$145,113
1968	151,902	8,382	160,284
1969	154,938	8,575	163,513
1970	155,229	9,425	164,654
1971	147,521	12,673	160,194
1972	163,031	10,484	173,515
1973	171,883	11,288	183,171
1974[2]	164,757	12,021	176,778
1975	176,926	10,476	187,400
1976	176,617	10,695	187,312
1977	195,331	9,669	205,000
1978	219,332	11,464	230,796
1979	266,308	11,320	277,628
1980	303,030	9,438	312,468
1981	322,484	11,280	333,764
1982	327,392	12,470	339,862
1983	356,155	13,658	369,813
1984	402,194	13,743	415,937

[1] Prior to fiscal year 1966, funds for NIGMS were in the General Research and Services appropriation.
[2] Impounded funds not included.

Major NIGMS Programs

Cellular and Molecular Basis of Disease Program

This program seeks a greater understanding of the structure and function of human cells, with the ultimate goal of finding ways to prevent, treat, and cure diseases that result from disturbed or abnormal cellular activity. Investigations are broadly concerned with the biophysical and biochemical description and analysis of molecular events in normal and diseased cells, and with the structure and function of organelles and membranes at the molecular and subcellular levels. Areas of research emphasis include: 1) detailed submolecular structure and function of enzymes, other proteins, and other biological substances; 2) development of knowledge of subcellular organelles and their constituents into more precise concepts of how the cell functions as a unit; 3) cell-cell interactions during morphogenesis; 4) mechanisms by which enzymes bring about their catalytic effects; and 5) elucidation of the relationship between chemical structure and biological activity.

Representative studies examine plasma and intracellular membranes, cell motility, and the cytoskeleton; the regulation and synchronization of protein and membrane synthesis; subcellular organelles; mechanisms of cell differentiation; cellular immunology and immunobiology; cell fusion; cell adhesion; the role of membrane-bound enzymes; lipid biochemistry; enzymology and regulatory processes in intermediary metabolism; the structure and function of the enzyme-active site, including the involvement of ligands, coenzymes, and metal ions; characterization of the energy-transducing apparatus; the ordered structure and behavior of proteins and other macromolecular systems; and protein synthesis and the assembly and properties of macromolecular complexes in cell membranes and organelles. Support is provided for studies on basic biological and biochemical principles, regardless of the particular experimental system being used. A broad array of highly quantitative methods and instruments is essential to this research.

The program supports pre- and postdoctoral research training in the fields of cell and molecular biology. A major portion of the NIGMS' training effort is administered by this program.

Genetics Program

This program is directed toward gaining a better understanding of fundamental processes and the mechanisms of inheritance in health and disease. The ultimate objectives of the Genetics Program research and research training are the prevention, therapy, or cure of genetic diseases. These include conditions caused by single-gene defects and chromosomal abnormalities, as well as multifactorial diseases with a strong hereditary component.

The NIGMS Genetics Program differs from others supported by disease-oriented NIH Institutes because it focuses on such basic topics as the mechanisms of transmission and expression of genetic information, genetic control mechanisms, and the dynamics of genes in populations of organisms. Scientists supported by the program make extensive use of model organisms such as bacteria, yeast, insects, and mice. The results of this research yield generalizable concepts about genetic disorders that complement the more targeted studies of the categorical Institutes.

Among the active research areas are studies on replication, recombination, and repair of DNA, including transformation and transfection of cells with foreign DNA; mechanisms of mutagenesis; extrachromosomal inheritance in mitochondria and other organelles; mechanisms of transcription and processing of RNA; protein synthesis; chromosomal organization and mechanics; control of gene expression; developmental genetics; rearrangement and transposition of genetic elements; cytogenetics and gene mapping; evolution and genetics of populations; and human medical and behavioral genetics.

Three types of research training in genetics are available. Institutional predoctoral programs

provide training on genetic principles and mechanisms. Similar training is offered at the postdoctoral level through individual fellowships. Institutional postdoctoral fellowships place special emphasis on training in human and medical genetics.

Along with research and training activities, the Genetics Program supports the Human Genetic Mutant Cell Repository, a unique service to scientists studying medical and human genetics. The repository establishes and stores cultured cell lines representing well-characterized metabolic and chromosomal disorders collected from patients and their families. These cells are provided to qualified investigators at nominal charge, thus permitting the researchers to study the cellular aspects of many rare genetic conditions using material that would otherwise be difficult to obtain.

The Genetic Sequence Data Bank (GenBank®), operated under a contract from NIGMS in cooperation with other components of NIH and the Federal Government, allows researchers to study similarities between the sequences of different genes. This resource collects data on nucleic acid sequences, verifies their accuracy, and annotates the data for sites of biological interest. The data are computerized for rapid retrieval and broad distribution to interested scientists.

Pharmacological Sciences Program

The Pharmacological Sciences Program supports research to provide improved understanding of biological phenomena and related chemical and molecular processes involved in the actions of therapeutic drugs, anesthetic agents, and their metabolites.

This program supports research ranging from synthetic chemistry and basic biological and biochemical studies in molecular pharmacology to comparative studies in cell cultures and laboratory animals, as well as controlled clinical investigations in patients and normal volunteers. Support of studies in biorelated chemistry encompasses the chemistry of natural products, chemical aspects of biological processes, the relationship between chemical structure and biological activity, and the synthesis of drugs.

The program maintains an active interest in anesthesiology research, focusing on the mode of action of anesthetics and muscle relaxants, basic physiologic and metabolic changes resulting from anesthesia, the interacion of anesthetics with other agents, and the management of respiratory failure. It encourages collaborative efforts among pharmacologists, physiologists, and anesthesiologists to broaden the scientific base of anesthesiology.

The Pharmacological Sciences Program takes a multifaceted approach to pharmacological problems which have implications for more than one disease area. Special interests include: the molecular mechanisms of chemical and biological interactions of drugs with receptors; the interaction of drugs with endogenous mediators of physiological response; metabolic pathways and mechanisms of drug action in human and other biological systems; the structures of active drug metabolites and intermediates; mechanisms of adverse drug reactions and the toxicity of therapeutic drugs; new approaches to the synthesis of compounds of biological interest; the design of new and controllable methods of drug delivery; the pharmacology of therapeutic drugs and anesthetic agents in children; and the nature of pain and the ways in which anesthetic agents modulate it.

The program has always had a firm commitment to the training of young scientists. In addition to the funding of pre- and postdoctoral research training through institutional awards and individual fellowships, the program administers a special training program that constitutes NIGMS' only intramural component. Each year a few exceptionally well-qualified young scientists at the postdoctoral level become pharmacology research associates. Under the aegis of NIGMS, these associates receive 2 years of intensive research training in other NIH laboratories. A specialized clinical pharmacology option is available to qualified physicians who desire training in that area. The goal of this program is to develop leaders in pharmacological research for academic, industrial, and government laboratories.

Biophysics and Physiological Sciences Program

The Biophysics and Physiological Sciences (BPS) Program has three major objectives. The first is to apply the physical, chemical, physiological, and engineering sciences to solve significant biomedical problems. The second is to develop new and improved instruments and techniques for research at the molecular, cellular, and organismic levels. Finally, the program seeks to broaden and strengthen the scientific base in those areas of clinical and physiological research, including trauma and burn injury, for which the Institute is responsible.

Supported research ranges from studies on the structure of proteins to clinical investigations, and includes certain aspects of the behavioral sciences. Areas of interest in biophysical research include physical and chemical studies on the structure of proteins and nucleic acids; studies of structural features that determine macromolecular conformation; structural analyses of macromolecular interactions and of

ligand-macromolecular interactions; development of physical techniques for the analysis of molecular structure; and theoretical approaches to molecular structure.

BPS support in bioengineering research includes the development of instruments in the areas of spectroscopy, x-ray and other scattering techniques, microscopy, and cell separation methods; the development of biomaterials and prostheses; and the application of control theory and mathematical modeling to the analysis of physiological systems. The BPS program also funds studies in physiology, biochemistry, and immunology as they relate to trauma and burns. This includes the biochemical and physiological changes induced by trauma, and fundamental aspects of wound healing and biological repair. In addition, the program encourages research on the treatment of posttraumatic infections, nutritional requirements of convalescing victims, and rehabilitation of injured patients. The BPS program also includes research in certain fundamental aspects of the behavioral sciences and adaption. In addition, the program funds pre- and postdoctoral research training in selected areas such as systems and integrative biology and trauma and burns.

Because of the shortage of physicians involved in research, NIGMS offers special training leading to the combined M.D/Ph.D. degree for highly motivated students with outstanding research and academic potential. This Medical Scientist Training Program, administered by the BPS program, yields clinical scientists who have obtained extensive research experience and background in the physical, biomedical, or behavioral sciences that is thought to be essential for the advancement of clinical research.

Minority Access to Research Careers (MARC) Program

Minority groups have been seriously underrepresented in scientific fields in the United States. To help tap this talent, the MARC program provides special training opportunities in biomedical sciences for students and faculty at institutions with substantial minority enrollments.

There are four types of support within the MARC program. Under the honors undergraduate research training award, highly qualified minority institutions receive grants to teach, provide research training, and support honors students in their third and/or fourth years of college who plan to obtain a Ph.D. and conduct research in some area of biomedical science. The predoctoral fellowship award assists outstanding graduates of the MARC honors undergraduate program in pursuing a Ph.D. degree in the biomedical sciences. Support is not provided for individuals enrolled in medical or other professional schools unless they are enrolled in a combined degree (i.e., an M.D./Ph.D.) program. Faculty fellowships provide opportunities for advanced study and research training to selected full-time faculty members of 4-year colleges, universities, and health professional schools in which student enrollments are drawn substantially from minority groups. Applicants must be nominated by their institutions. Faculty fellows may pursue a Ph.D. degree or obtain postdoctoral research training at any nonprofit public or private institution in the United States with suitable facilities, but are expected to return to their sponsoring institutions after completion of their fellowships. Finally, visiting scientist fellowships are awarded to outstanding scientist-teachers to serve as visiting faculty at 4-year colleges, universities, and health professional schools with substantial minority enrollments. The primary intent is to strengthen research and teaching programs in the biomedical sciences for the benefit of students and faculty at these institutions. The award is made for periods of 3 to 12 months.

The MARC program is administered in collaboration with the National Cancer Institute; National Eye Institute; National Institute on Aging; National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases; National Institute of Allergy and Infectious Diseases; National Heart, Lung, and Blood Institute; National Institute of Child Health and Human Development; National Institute of Neurological and Communicative Disorders and Stroke; National Institute of Dental Research; and National Institute of Environmental Health Sciences. MARC complements the Minority Biomedical Support Program of the NIH Division of Research Resources, in which funds are granted directly to minority institutions to strengthen both bioscience faculties and teaching facilities.

National Institute of Neurological and Communicative Disorders and Stroke*

Mission

Conducts, fosters, coordinates, and guides research on the causes, prevention, diagnosis, and treatment of the neurological and communicative disorders, and stroke, and supports basic research in related scientific disciplines.

*Originally National Institute of Neurological Diseases and Blindness. Name changed August 16, 1968, to National Institute of Neurological Diseases; October 24, 1968, to National Institute of Neurological Diseases and Stroke; March 14, 1975, to present name.

Provides grants-in-aid to public and private institutions and individuals in fields related to its areas of interest, including research project, program project, and research center grants.

Operates a program of contracts for the funding of research and research support efforts in selected areas of institute need.

Provides individual and institutional fellowships to increase scientific expertise in neurological and communicative fields.

Conducts a diversified program of intramural and collaborative research in its own laboratories, branches, and clinics.

Collects and disseminates research information related to neurological and communicative disorders.

Important Events in NINCDS History

1950—On August 15 President Truman signed P.L. 81-692, establishing the National Institute of Neurological Diseases and Blindness.

1951—NINDB received its first budget of $1,232,253 and Dr. Pearce Bailey was appointed Director.

1953—The NINDB budget became a line item in the NIH budget.

1953-54—An intramural program of clinical investigation was initiated, including medical neurology, surgical neurology, and electroencephalography. Training programs in neurology and ophthalmology were initiated.

1955—Basic science training grants were initiated.

1956—The intramural clinical investigations program was expanded to include work in ophthalmology.

1957—Training programs in otolaryngology and pediatric neurology were begun.

Field investigations involving collaborative and cooperative clinical studies were begun and the initial phase of the Collaborative Perinatal Project was started.

1959—Dr. Richard L. Masland became the second Director of NINDB.

1960—The joint intramural basic research program of NINDB and NIMH was divided and organized into two basic research laboratory programs.

1961—First program projects and clinical research centers in stroke and communicative disorders were supported.

1962—Funds were appropriated for professional and technical information assistance. Training grants in neurosurgery and neuroradiology were initiated.

1963—Developmental graduate training grants were initiated.

1965—A head injury research program was established.

1966—The stroke research program was expanded; additional grants for clinical research centers were awarded. An antiepileptic drug testing program was begun.

1967—Vision outpatient research centers were established. A program of research in neural control mechanisms and prostheses was initiated.

1968—Dr. Edward F. MacNichol, Jr., became the third Director of the Neurology Institute. The blindness program of the Institute became the nucleus of the new National Eye Institute. The Institute was renamed the National Institute of Neurological Diseases and Stroke.

1969—Research Building 36, dedicated by DHEW Secretary Robert H. Finch, was occupied by NINDS and NIMH research laboratories.

1971—Programs in applied neurologic research (epilepsy; head injury), infectious diseases and biometry were added to the Collaborative and Field Research Division.

1972—Advances in the intramural slow virus and genetically determined metabolic disorder programs were highlighted.

1973—Two new communicative disorders progams were begun with establishment of a Section on Communicative Disorders, Collaborative and Field Research, and an intramural Laboratory of Neuro-Otolaryngology.

1974—Dr. Donald B. Tower became fourth NINDS Director. Laboratories for neuroimmunology and neuropharmacology were established.

1975—NINDS was renamed the National Institute of Neurological and Communicative Disorders and Stroke.

NINCDS was reorganized into six major program units for *intramural research, fundamental neurosciences, communicative disorders, neurological disorders, stroke and trauma,* and *extramural activities.*

1976—Dr. D. Carleton Gajdusek, chief, Laboratory of Central Nervous System Studies, was awarded the Nobel Prize in Physiology or Medicine for work on atypical slow viruses.

1978—NINCDS completed a comprehensive long-range plan for research in neurological and communicative disorders.

The NINCDS Laboratory of Central Nervous System Studies was expanded through acquisition of animal holding and virus containment facilities at the NIH Frederick Cancer Research Center, Ft. Detrick, Md.

1979—A Neuroepidemiology Section and a Section of Neurotoxicology were established within the intramural research program. NINCDS substantially expanded extramural support of research studies using positron emission tomography.

1982—Dr. Murray Goldstein became the fifth NINCDS Director. The Institute's Neurological Disorders Program was replaced by two new program units: convulsive, developmental, and neuromuscular disorders; and demyelinating, atrophic, and dementing disorders.

NINCDS Legislative Chronology

August 15, 1950—Public Law 81-692 established NINDB "for research on neurological diseases (including epilepsy, cerebral palsy, and multiple sclerosis) and blindness."

August 16, 1968—Public Law 90-489 renamed the NINDB the National Institute of Neurological Diseases.

October 24, 1968—Public Law 90-636 changed the name of the NIND to the National Institute of Neurological Diseases and Stroke.

October 25, 1972—Public Law 92-564 established a temporary National Commission on Multiple Sclerosis supported by NINDS.

March 14, 1975—Part 8 of a DHEW Statement of Organization, Functions, and Delegations of Authority was amended to change the title of NINDS to the National Institute of Neurological and Communicative Disorders and Stroke.

July 29, 1975—Public Law 94-63 established two temporary commissions to be supported by NINCDS: Commission for the Control of Epilepsy and Its Consequences, and Commission for the Control of Huntington's Disease and Its Consequences.

Biographical Sketches of NINCDS Directors

Pearce Bailey, M.D.
Dr. Bailey, the first Director of NINDB, was born in New York City in 1902. Prior to assuming the directorship in 1951, a post which he held until 1959, he was chief of neurology of the Veterans Administration. He served as director of International Neurological Research for NINDB in Antwerp, Belgium, from 1959 until 1962, and as special assistant to the director in Puerto Rico and later in Bethesda until his retirement in 1971.

Dr. Bailey received the Ph. D. from the University of Paris (Sorbonne) and his M.D. from the Medical College of South Carolina in 1941. The author of numerous articles, he prepared the English version of *J. M. Charcot—His Life and Work* in 1959. Dr. Bailey died on June 23, 1976.

Richard L. Masland, M.D.
Dr. Masland, the Institute's second Director, was born in Philadelphia on March 24, 1910. He received his M.D. from the University of Pennsylvania Medical School in 1935; served as a fellow and associate in neurology at the University of Pennsylvania from 1938 to 1946; and as a fellow in psychiatry at the Pennsylvania Institute for Mental Hygiene in 1946. On leave from the university, he was an officer in the U.S. Army from 1942 to 1945, as director of the department of physiology, school of aviation medicine. For 10 years prior to coming to NINDB in 1957, he was professor of neurology at the Bowman Gray School of Medicine, Winston-Salem, N.C. On leave, he served as research director of the National Association for Retarded Children in 1955–56. Dr. Masland has written many articles and is the coauthor of a book entitled *Mental Subnormality*, which appeared in 1958.

In 1968, Dr. Masland left the Institute to become professor of neurology and chairman of the department of neurology, Columbia University College of Physicians and Surgeons.

NINCDS Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total
	[Amounts in thousands of dollars]		
1954	$3,354	$1,146	$4,500
1955	5,054	2,546	7,600
1956	6,300	3,561	9,861
1957	14,280	4,370	18,650
1958	16,250	5,137	21,387
1959	23,166	6,237	29,403
1960	33,908	7,579	41,487
1961	47,867	8,733	56,600
1962	56,240	14,572	70,812
1963	67,022	16,484	83,506
1964	74,241	13,434	87,675
1965	73,147	14,674	87,821
1966	84,800	16,353	101,153
1967	96,130	20,166	116,296
1968	107,001	21,632	128,633
1969	78,006	25,259	[1] 103,265
1970	81,186	26,179	107,365
1971	75,884	27,618	103,502
1972	86,542	30,048	116,590
1973	99,640	31,032	130,672
1974	91,874	33,126	125,000
1975	101,893	40,605	142,498
1976	102,935	41,511	144,446
1977	109,561	45,939	155,500
1978	125,199	53,239	178,438
1979	146,946	65,419	212,365
1980	175,841	66,125	241,966
1981	188,907	63,646	252,553
1982	198,176	67,725	265,901
1983	223,056	74,008	297,064
1984	255,712	80,171	335,883

[1] Excludes funds for blindness, established as a separate appropriation "National Eye Institute" in 1970.

Edward F. MacNichol, Jr., Ph. D.
Dr. MacNichol, appointed Director of NIND on September 1, 1968, was born in Toledo, Ohio, in 1918. Formerly professor of biophysics at Johns Hopkins University, he had been at that institution since 1949.

He is an internationally known neurophysiologist with broad research experience. He became a recognized authority on vision research, and was coauthor of several articles on vision physiology with Dr. Haldan K. Hartline of Rockefeller University, winner of the 1967 Nobel Prize in Physiology or Medicine.

After receiving an A.B. degree in physics in 1941 from Princeton University, Dr. MacNichol spent 5 years at the Massachusetts Institute of Technology Radiation Laboratory as a staff member working on automatic radar range

tracking devices, relay radar, and missile guidance systems. He was a graduate student at the Eldredge Reeves Johnson Foundation of the University of Pennsylvania, 1947–1948, and received his Ph. D. degree from Johns Hopkins University in 1952.

He left the Institute in 1973 to join the staff of the Marine Biological Laboratory at Woods Hole, Mass.

Donald B. Tower, M.D., Ph. D.
Dr. Tower was appointed Director of NINDS on May 31, 1974, after serving as Acting Director for the prior year. He had been chief of the Laboratory of Neurochemistry since 1963, and was chief, Section on Clinical Neurochemistry, from 1953 to 1963. For the 1-year period 1967–68, he also served as acting associate director for extramural programs.

A graduate of Harvard College, he received his M.D. from Harvard Medical School in 1944, and his Ph. D. in neurochemistry from McGill University in Montreal, Canada, in 1951. He then became an associate neurochemist at the Montreal Neurological Institute and an assistant professor of experimental neurology and Markle Scholar at McGill University.

While Director, Dr. Tower held the rank of Assistant Surgeon General in the PHS regular corps, and was an associate professor of neurology at Georgetown University Medical School, Washington, D.C.

He is a member of numerous professional societies, and has written over 100 papers including the monograph, *Neurochemistry of Epilepsy.* He is the author of *Hensing, 1719, An Account of the First Chemical Examination of the Brain and Discovery of the Phosphorus Therein* published in 1983. He retired from Federal service on February 1, 1981.

Murray Goldstein, D.O., M.P.H.
Dr. Goldstein, the Institute's fifth Director, was appointed on December 23, 1982, after serving as Acting Director for the previous 2 years. He had been deputy director of NINCDS since 1978, and was director of the Stroke and Trauma Program from 1976 to 1978. He had also been director of the Institute's Extramural Programs from 1961 to 1976.

A native of New York City, he is known worldwide as a leader in the neurosciences, serving as a consultant to the World Health Organization and holding membership in major professional neuroscience societies. He also serves on the editorial boards of several neurological and osteopathic journals, and is associate editor of the journal *Stroke.*

Dr. Goldstein, who was a visiting scientist in neurology with the Mayo Clinic in Rochester, Minn., from 1967 to 1968, is an Assistant Surgeon General in the Public Health Service.

Major Programs

NINCDS is organized as seven programs: *stroke and central nervous system trauma, communicative disorders, fundamental neurosciences, convulsive, developmental and neuromuscular disorders; demyelinating, atrophic, and dementing disorders;* and an *extramural activities program* for support and coordination. An *intramural research program* conducts laboratory and clinical research in NIH laboratories.

Stroke and Central Nervous System Trauma

Stroke is the third leading cause of death in the U.S. and a leading cause of disability. The annual death rate is about 160,000. It is estimated that 1.9 million persons have survived strokes with varying amounts of disability.

Nervous system trauma, largely the result of accidents, is a massive problem in the U.S., with more than 200,000 people suffering from paraplegia and quadriplegia, and an estimated 1 million persons disabled by head injuries.

Stroke research focuses on the problems of ischemia, edema, potassium leakage, neurotransmitter imbalances, and astrocyte swelling. New monitoring devices and techniques appear promising. Studies of experimentally induced clots in animals are leading to better understanding of the transient ischemic attack (TIA)—often a forerunner of a major stroke and a primary target for preventive efforts.

A collaborative evaluation of a new surgical procedure to relieve TIA's and subsequent stroke—involving the connection of the superficial temporal artery to the middle cerebral artery—is underway.

Completed projects include controlled evaluations of steroid therapy in cord injury patients and administration of barbiturate following resuscitation. In progress are studies of drug treatment for incapacitating headache, and surgical management for cerebral aneurysm, and therapeutic intervention in early stroke.

NINCDS strongly encouraged development of several new clinical research techniques—computerized tomography scanning, positron emission tomography (PET), ultrasonic scanning and nuclear magnetic resonance (NMR). The year 1984 was the fifth year of a special program of grants to exploit new biomedical research opportunities opened up by the PET technique.

Grants and contracts are also awarded for research in neural regeneration and plasticity. These studies are extending and

confirming the basic knowledge upon which applied research, and eventually clinical application, will be based.

Communicative Disorders Program
The Communicative Disorders Program encourages and supports research on diagnosi , treatment, and prevention of disorders of hearing, chemosenses, language, and speech. More than 20 million Americans are afflicted with these problems. Included in this figure are an estimated 16 million persons with a handicapping communication impairment, of whom some 2 million suffer from severe or complete deafness; approximately 2 million suffer from chemical sense deficiencies (taste, smell); approximately 2 million have an impaired ability to comprehend language; and about 10 million have speech disorders. These figures reflect the enormous impact of these problems.

Emphasis is placed on the prevention and early diagnosis of hearing impairments that may result from exposure to noise or ototoxic drugs, and on the causes and treatment of tinnitus. Basic studies of the anatomy, physiology and biochemistry of hearing continue.

The objective of research sponsored by the program in the senses of taste, smell and touch is to understand the normal function of the central nervous system and the relationship of these senses to the early detection of systemic disease. An important related goal is the establishment of clinical research centers which can serve as focal points for research to improve the prevention of disorders of taste and smell and improve the care of patients with these disorders.

The speech, language, and voice program studies the normal bases of these functions as well as disorders such as stuttering, misarticulation, delayed language development, and phonatory disorders. Research on the treatment of dysarthria and aphasia following neurological disease, stroke, and trauma is encouraged, and scientists are developing new prostheses for severly disabled nonvocal patients. In addition, research centers are developing improved techniques for studying the neurophysiology of speech and the coordination of articulators in disordered speech production.

Fundamental Neurosciences
The highly diversified Fundamental Neurosciences Program placesspecial emphasis on studies of the neurophysiology of cognitive processes, particularly those which can be studied at the neuronal level. Another area involves investigation of somatic-autonomic mechanisms of neuronal interaction. Research on nerve impulse receptors, especially isolation and purification of cholinergic receptors, has made possible many important experimental and clinical studies. Also, specific opiate receptors have been identified—work of great relevance to the understanding of drug tolerance, habituation, and withdrawal, as well as the problem of pain mechanisms.

Other major areas include the plasticity of the central nervous system—its ability to drop or modify old connections, form new ones, and to reshape neural networks. Local circuits served by short-axon or axonless neurons have been thought of as comprising a "second" nervous system which might some day be made to modulate CNS activity.

A special activity supported largely by contracts is directed at development of neural prostheses for stroke, paraplegia, and deafness victims.

Convulsive, Developmental, and Neuromuscular Disorders Program
The Convulsive, Developmental, and Neuromuscular Disorders Program stimulates and supports research in neurological disorders, including disorders of early and adult life, and epilepsy.

The program's Developmental Neurology Branch supports research on the neurobiology of developmental disorders of children, including cerebral palsy and other motor disorders, mental retardation and learning disorders, autism and behavioral disorders, and CNS birth defects and genetic disorders. In addition, the branch supports research on neuromuscular disorders including muscular dystrophy, myasthemia gravis, and the peripheral neuropathies.

The Epilepsy Branch encourages research programs to improve the prevention, diagnosis and treatment of epilepsy. Research is supported on convulsive and other paroxysmal disorders of the nervous system, including epilepsy, narcolepsy, and disorders of sleep. The branch administers an extensive antiepileptic drug development and monitoring program at NIH.

Demyelinating, Atrophic, and Dementing Disorders Program
The Demyelinating, Atrophic, and Dementing Disorders Program encourages and supports basic and clinical research relating to the understanding, diagnosis, treatment, and prevention of a variety of neurological disorders. Diseases of adult life, including Alzheimer's disease and other dementias, Parkinson's disease, Huntington's disease, and amyotrophic lateral sclerosis, are program responsibilities, along with demyelinating disorders such as multiple sclerosis.

In addition, research is funded on the hereditary ataxias and on infectious diseases, including "slow" virus diseases, encephalitis, and meningitis. Biological research emphasizing neuroendocrinology

and the neurological basis of pain is also supported.

Research activities include studies of the physiology, biochemistry, pharmacology, anatomy, pathology, genetics, and epidemiology of these diseases and related conditions in humans and in animal models.

Extramural Activities Program

The Extramural Activities Program provides administrative support and coordination for the Institute's research grant and contract activities. The program directs and carries out scientific and technical merit review of proposals for research contracts, program projects, clinical research centers, special research grants such as milti-institutional clinical trials, and career development and research training. Management services for research grant and contract activities are also provided.

The program also coordinates training of young investigators in all research areas mentioned above. This includes institutional and individual training awards as well as support through new investigator research awards, research career development awards, and clinical investigator development awards.

Intramural Research Program

The NINCDS Intramural Research Program conducts basic and clinical research in the neurological and communicative sciences and relevant disciplines. Notable achievements in the past have included drug therapies for debilitating neurologic diseases such as parkinsonism, new techniques to help scientists better understand how the brain and nervous system function, and major research advances in neurovirology, neurochemistry and other highly promising fields.

NINCDS scientists continue to explore CNS disorders such as Creutzfeldt-Jakob disease that appear to be slow infections caused by transmissible virus-like agents. These agents are unique in some respects, but in others exhibit classical viral properties. Research focuses on delineating the agents' chemical and biological nature, and on learning the nature of defective interfering virus particles, which in some way repress the replication of infectious virus.

Inherited disorders of lipid metabolism such as Gaucher's disease, Niemann-Pick's disease, Fabry's disease, Krabbe's disease, and Tay-Sachs disease are studied. This work includes biochemical and diagnostic studies, carrier identification, and genetic counseling, and studies on the molecular basis of the diseases and the development of therapy for these disorders.

NINCDS has continued to accumulate evidence of pharmacologically distinct categories of dopamine receptor molecules in the mammalian nervous system. This knowledge helps to explain the blocking or stimulating effects of various drugs, and may lead to better control of movement disorders.

In the Neuroimmunology Branch, researchers continue basic and clinical investigations related to multiple sclerosis. Studies of identical and nonidentical twin sets are being carried out in which both or only one twin has multiple sclerosis. In addition to providing information on the rule of genetic factors in multiple sclerosis, these twins are also being studied to identify differences between the affected and unaffected members. Potential treatments for the disease, including leukopheresis and administration of the interferon-inducing agent Poly IC:LC, are also being tested.

The Laboratory of Molecular Biology is investigating the mechanism controlling the initiation of meiosis and cell differentiation and the synthesis of neuroreceptors. These studies contribute to the understanding of genetic and developmental disorders, and have demonstrated how some of the disorders can be avoided by the careful use of drugs and proper nutrition during pregnancy.

In the Surgical Neurology Branch, the Institute has undertaken an intensive study of brain tumors, using tissue cultures. Tumor cells in culture retain many of their in vivo characteristics and can be graded in terms of malignancy, measured for response or reaction to anticancer drugs, and studied immunologically.

Laboratory of Molecular Genetics scientists explore the molecular events involved in duplication and expression of mammalian and viral chromosomes, and apply the latest techniques to the study of recombinant DNA cloning. Some viruses produce structures known as defective interfering particles, which inhibit replication of the viruses from which they come. NINCDS scientists study the action of these particles on mumps viruses, with a view toward finding ways to limit, treat, and prevent mumps and other viral infections of the nervous system.

The Neuroepidemiology Branch studies the factors influencing occurrence of neurologic disorders in population groups. The branch carries out research involving epidemiological and genetic techniques that might resolve clinical problems related to the cause, prevention, and treatment of these disorders.

Many research projects in computed tomography advance the clinical applications of the technique as well as provide scientists with a wealth of valuable research data. Studies with the PET scanner have shown a relationship between glucose uptake and brain tumor growth.

This scanning technique allows researchers to obtain pictorial data (axial transverse or coronal images of the brain) as well as dynamic functional data such as regional cerebral glucose consumption rate; measurements of the storage, degradation, and turnover of radioactively tagged metabolites; and tracings of cerebrospinal fluid in deep areas of the brain.

Laboratory of Neurophysiology scientists conduct research in several areas related to the basic mechanisms underlying the excitability of neurons and the communication of chemical signals among neurons. All research projects utilize in vitro preparations of nerve cells, since these afford excellent opportunities for discovering the mechanisms of excitability at the membrane level.

The Laboratory of Neurobiology develops and applies innovative structural techniques to basic problems in cell, membrane, and molecular neurobiology. Staff scientists study the secretory mechanisms in synaptic transmission, organelle movements in axoplasmic transport, and neuronal cytoplasmic organization. The laboratory also conducts research on the distribution of ions in nerve cells, and on lipids and the organization of neural and glial membranes.

The Laboratory of Neuro-Otolaryngology conducts research on the neurophysiological and biochemical mechanisms of hearing which includes efforts to characterize neurotransmitters of the auditory pathways. Sensory cells of the organ of hearing are being studied in vitro.

Biometry and Field Studies Branch
The Biometry and Field Studies Branch supports a program in biostatistics and computer science to further medical research in neurological and communicative disorders. The office is active in a number of areas including computer-based clinical data banks, clinical trials, and national surveys of disease, and collaborates with NINCDS intramural scientists in a variety of projects. In accomplishing these tasks, staff members apply mathematical statistics, demography, survey statistics, and computer science.

The branch organized and manages the NINCDS Stroke and Traumatic Coma Clinical Data Banks to provide a data resource for research workers to study clinical course and outcome. These data banks are prospective studies of hospitalized stroke and coma patients.

The branch acts as the statistical coordinating center for several continuing or planned intramural and extramural clinical trials and longitudinal field studies involving U.S. and foreign scientists. One international project is a cooperative study to determine whether electroencephalography can predict if a child who has had one seizure associated with fever will have another.

National Institute on Aging

Mission

In addition to the physical infirmities resulting from advanced age, the economic, social, and psychological factors associated with aging often exclude millions of older Americans from the full life and the place in our society to which their years of service and experience entitle them. Because the study of the aging process—the one biological condition common to all—had not received research support commensurate with its effects on every individual, Congress created the National Institute on Aging in 1974 to conduct and support research and training in aging.

The NIA was given responsibility for "biomedical social, and behavioral research and training related to the aging process and diseases and other special problems and needs of the aged."

Important Events in NIA History

December 2, 1971—The White House Conference on Aging recommended the creation of a separate National Institute on Aging.

May 31, 1974—Public Law 93-296 authorized the establishment of a National Institute on Aging and required that the Institute develop a national comprehensive plan to coordinate the HEW agencies involved in aging research.

October 7, 1974—The National Institute on Aging was established.

January 8, 1975—The Implementation Plan for P.L. 93-296 was submitted to the Assistant Secretary for Health.

April 23, 1975—First meeting of the National Advisory Council on Aging was held.

July 1, 1975—The Adult Development and Aging Branch and Gerontology Research Center were separated from their parent Institute to become the core of the National Institute on Aging.

May 1, 1976—Dr. Robert N. Butler assumed the position of first permanent NIA Director.

December 8, 1976—The research plan required by P.L. 93-296 was transmitted to the Congress. This comprehensive plan for HEW-conducted and -supported aging research is entitled *Our Future Selves.*

July 26, 1982—Dr. Robert L. Ringler assumed position of Acting NIA Director.

September 20, 1982—NIA Laboratory of Neurosciences Clinical Program admitted the first

inpatient to a new unit at the NIH Clinical Center.

July 1, 1983—Dr. T. Franklin Williams assumed position of NIA Director.

September 9–11, 1983—The Institute celebrated the 25th anniversary of the Baltimore Longitudinal Study of Aging. The first volunteers joined this unique study in 1958.

Biographical Sketches of NIA Directors

Norman Kretchmer, M.D., Ph. D. (Acting)
Dr. Kretchmer was named NIA Acting Director upon the Institute's establishment in October 1974. He held the dual posts of NIA Acting Director, and Director of the National Institute of Child Health and Human Development until July 1975. He left the post of NICHD Director to accept dual positions with the University of California in September 1981.

Richard C. Greulich, Ph. D. (Acting)
Dr. Greulich assumed the position of Acting Director, NIA, in July 1975, at the same time the Gerontology Research Center was transferred to the new Institute.

He was awarded a doctorate in anatomy in 1953 at McGill University, Montreal. Following this he taught at the University of California, Los Angeles, until 1966 when he left his positions as professor of anatomy, School of Medicine; professor of oral biology and chairman, division of oral biology, School of Dentistry, to come to NIH. He served as the director of intramural research of the National Institute of Dental Research from 1966 to 1974, when he became staff director of the President's Biomedical Research Panel and then special assistant to the Acting Director, NIA.

Dr. Greulich was appointed NIA scientific director and director of the Institute's Gerontology Research Center in January 1977.

Robert N. Butler, M.D.
Dr. Butler became the first permanent NIA Director on May 1, 1976. Prior to that appointment, he was a practicing psychiatrist and psychoanalyst as well as a research psychiatrist and gerontologist at the Washington School of Psychiatry.

Born in New York City in 1927, he graduated from Columbia College, and received his medical degree from the Columbia University College of Physicians and Surgeons. He has served on the faculties of the Washington Psychoanalytic Institute, the Washington School of Psychiatry, and the Howard and George Washington University Schools of Medicine.

Dr. Butler's activities over the past 20 years encompass research and observation, clinical practice, writing, and public advocacy. His book *Why Survive? Being Old in America* was awarded the 1976 Pulitzer Prize for general nonfiction. He has been the recipient of numerous honors and awards including: A. Ross McIntyre Award (1978); American Psychiatric Association Founders Award (1978); elected to the National Academy of Sciences Institute of Medicine (1979); Donald P. Kent Award (1980); and the Public Health Service Distinguished Service Medal (1980).

Dr. Butler left NIA to assume the position of chairman and director of the Ritte Department of Geriatrics and Adult Development Branch, and Brookdale professor of geriatrics and adult development at the Mt. Sinai Center in New York.

Robert L. Ringler, Ph. D. (Acting)
Dr. Ringler was appointed Acting NIA Director on July 26, 1982. He was born on March 27, 1922, in Chase, Mich. He received his A.B. in chemistry and biology from Central Michigan College in 1951, and his Ph. D. in biochemistry from Michigan State University in 1955.

From 1955 to 1957 he was assistant professor in the department of biochemistry at North Carolina State College in Raleigh, and from 1957 to 1961 he was a senior associate at the Edsel B. Ford Institute for Medical Research, Henry Ford Hospital in Detroit.

Dr. Ringler began his NIH career in 1961 as a scientist administrator in the then National Heart Institute. He held consecutive positions in the NHLI as chief, Program Projects Branch, and chief, Institutional Research Programs. From March 1969 to January 1978 he served as deputy director, NHLBI; and from April 1974 to July 1975 was Acting NHLBI Director. During 1971–1972 he served as the initial DHEW coordinator for sickle cell anemia and played a major role in launching the National Sickle Cell Disease Program. He left the NHLBI in January 1978, to become NIA deputy director.

He is a member of the American Society of Biological Chemists, the American Heart Association, and a fellow of the American College of Cardiology. In 1970 he received the DHEW Superior Service Honor Award and in 1981 a Senior Executive Service Bonus Award.

Dr. Ringler retired from Federal service, June 30, 1983.

T. Franklin Williams, M.D.
Dr. Williams was appointed NIA Director on July 1, 1983. He was born on November 26, 1921, in Belmont, N.C., and graduated from the University of North Carolina (B.S., 1942), Columbia University (M.A., 1943), and Harvard Medical School (M.D., 1950).

His postgraduate training included internship and a residency in internal medicine at the Johns Hopkins Hospital, Baltimore, Md. He was senior resident physician at Boston's Veterans Administration Hospital, and a research fellow in medicine at the University of North Carolina prior to his appointment as an instructor there in 1956. He served on the North Carolina faculty for 12 years and was a professor of medicine and preventive medicine.

For 15 years immediately prior to joining the NIA, Dr. Williams was a professor of medicine, of radiation biology and biophysics, and of preventive, family and rehabilitation medicine at the University of Rochester School of Medicine and Dentistry. He was also the codirector of the Center on Aging, University of Rochester Medical Center and medical director of the Monroe Community Hospital.

He was elected to membership in the Institute of Medicine of the National Academy of Sciences in 1976, and served as a member of the Institute Council, and its representative on the governing board of the National Research Council. He is a fellow of the American College of Physicians, the American Geriatics Society, the American Association for the Advancement of Science, and the American Public Health Association.

NIA Appropriations—Grants and Direct Operations

Fiscal year	Total grants [1]	Direct operations	Total
	[Amounts in thousands of dollars]		
1975 [2]	$9,565	$6,424	$15,989
1976	11,445	7,843	19,288
1977	19,852	10,148	30,000
1978	24,375	12,930	37,305
1979	37,888	19,023	56,911
1980	43,952	26,036	69,988
1981	50,260	25,348	75,608
1982	55,410	26,493	81,903
1983	63,483	30,513	93,996
1984	79,872	35,420	115,292

[1] Includes research grants and research manpower development awards. Excludes research contracts.
[2] Comparable amount. Appropriations for aging are included within the NICHD appropriation for FY 1975.

Intramural Research

The bulk of the NIA intramural research program is conducted at the Gerontology Research Center in Baltimore, Maryland. The Laboratory of Neurosciences operates basic and clinical research programs from the Clinical Center at NIH. Via the NIH medical staff fellow, staff fellowship, a cooperative geriatric medicine fellowship with Johns Hopkins, and visiting programs, scientists at various stages of their careers gain sophisticated gerontology experience at the center. Over 250 postdoctoral investigators have been trained at the GRC since 1940.

Investigators in the Comparative Nutrition Section study the relationship between aging and nutrition in animal populations. Specific areas studied include the effects of age on absorption, distribution, and utilization of known nutrients and the mechanisms responsible for increased life span associated with dietary restriction. Other studies deal with comparative mammalian biochemistry including research on the stability of gene control mechanisms and the characterization of chromatin.

Experimental Morphology Section scientists use the most modern techniques of microscopy (transmission electron microscopy, scanning electron microscopy), and related techniques of high resolution autoradiography as well as electron and X-ray probe microanalysis to study structural-functional relationships during aging.

Scientists in the Clinical Physiology Branch conduct research emphasizing the physiological changes that occur throughout the entire adult life span. Studies include quantification of age changes, elucidation of mechanisms underlying these changes, and the relation between aging processes and specific disease states.

The Baltimore Longitudinal Study of Aging is a primary and unique resource of these investigations. Over 550 volunteer men, ranging in age from 20 to 96 years, come to the center every 2 years and undergo 2½ days of extensive clinical, biochemical, and psychological tests. A women's program, initiated in 1978, has already added some 375 subjects and will eventually include a female sample equal to that of the males, allowing scientists to make important comparisons of sex differences across the life span.

In the Laboratory of Behavioral Sciences, researchers study the interaction between behavioral aging and physiological processes. Behavioral scientists seek to explain the nature of cognitive function changes that may occur over the adult life span.

Other investigators delve into the effects of aging on motor behavior, perceptual skills, learning, memory, problem solving, and personality characteristics. Scientists in this laboratory also study stresses such as physical declines and illness, retirement and widowhood and the coping methods used to deal with them.

Researchers in the Laboratory of Cellular and Molecular Biology conduct studies at the cellular and molecular levels emphasizing genetic information transfer and environmental effects related to the aging process. Included are studies of the effects of metal ions on nucleic acid structure and genetic information transfer, the interaction of cells with synthetic macromolecules, age-dependent alterations of chromatin, and mechanisms of somatic and germ cell aging.

Laboratory of Molecular Aging scientists conduct research to identify and characterize the biochemical, biophysical, and molecular mechanisms by which physiological functions become altered with age. Studies focus on membrane biology with investigations on membrane molecular organization. Membranes isolated from the kidney, heart, brain, liver, gastrointestinal tract, skeletal and smooth muscle, and salivary glands are used as models.

Investigators in the Laboratory of Neurosciences (LN) study the function, structure, physiology, biochemistry, and pharmacology of the central and peripheral nervous system and of muscle. The researchers examine the changes which take place during aging and development in both animal models and in man.

In September 1982 the LN Clinical Program admitted the NIA's first inpatients to a new unit in the NIH Clinical Center.

Epidemiology, Demography, and Biometry Program

EDBP collects and evaluates data on health and illness in the older population. The intramural scientific research carried out by EDBP staff is supplemented by research contracts, interagency agreements, and numerous working arrangements with Federal and non-Federal organizations. Basic information is generated on current and projected health, economic, social, and occupational status of older people.

In addition, researchers gather, utilize, and analyze information from a variety of sources including the Bureau of the Census, the National Center for Health Statistics, and other NIH Institutes.

The program initiated a followup of the national Health and Nutrition Examination Survey. It includes 14,400 people examined for medical and nutritional status from 1971–1974. People have been reinterviewed to determine subsequent disease, institutionalization, and death, and to identify the relationship between nutrition and health conditions related to smoking, use of alcohol, exercise, and changes in behavioral and other characteristics.

Another study of 14,000 healthy elderly people over age 65 versus those with various diseases and impairments is under way in one rural and two urban communities and an area in which the majority of the population is black. Three investigations involve the related factors, natural history, and outcome of diseases such as senile dementia and hypertension. These people will be followed for 5 years or longer.

Other areas of interest include hip fracture and osteoporosis; events and conditions common to older persons during the days and weeks prior to dying; sleep disturbance; constipation; and the relationship between cancer and aging and alcoholism and aging. A macroeconomic-demographic model is operative and research concerning patterns of health in aging is in progress.

Extramural Programs

Biomedical Research and Clinical Medicine

This program supports biomedical and clinical studies through various NIH grant mechanisms and contracts. A brief description of each area is provided below.

The Resource Development Program supported primarily by research contracts encourages studies on comparative aging processes in vertebrates. This program provides mice and rats of various species and ages to NIA grantees and, as supplies allow, to other investigators for pilot studies and doctoral dissertation research.

Molecular and Cellular Biology Branch

This branch plans, implements, and supports fundamental molecular and genetic research on the mechanisms of aging. It also supports resource facilities that provide aged animals and cell cultures for use in aging research.

The Molecular Biology Section funds studies aimed at understanding the molecular basis of aging. Researchers investigate the production and maintenance of proteins, membrane components, and nucleic acids (RNA and DNA).

The Cell Biology Section investigates aging at the cellular level, encouraging use of cell-culture technologies, tissue and cell transplantation, and animal studies in the search for age-associated alterations in patterns of cell growth, proliferation, and differentiation.

The Genetics Section supports comparative studies on a wide range of organisms—with emphasis on mammalian models—to provide knowledge of basic genetic mechanisms involved in aging and longevity.

Physiology of Aging Branch

This branch fosters development of integrated clinical and basic research in nutrition, immunology, endocrinology, exercise physiology and neuroscience as they relate to aging.

The Immunology Section encourages research on age-related changes in the immune system, a source of dysfunction in the elderly. Since many age-related diseases may have an immunological basis, the section's ultimate goal is to define new ways to respond to such changes.

The Exercise Physiology Section supports research on the integration of the nervous, musculoskeletal, cardiovascular, pulmonary-respiratory, and endocrine systems to provide basic

information for clinical treatment. Clinical studies also focus on the preventive and therapeutic roles of exercise.

The Neuroscience Section fosters a spectrum of research on the aging process and concomitant changes in the structure and function of the nervous system. The specific aim is to encourage the development and dissemination of information in both basic and clinical neuroscience.

Geriatrics Branch

This branch supports the development of clinical research on the special medical needs and problems of the growing elderly population in the United States.

The Geriatric Research Section encourages basic and clinical research to improve current therapies for medical problems such as incontinence, osteoporosis, and infectious diseases of the elderly.

The Geriatric Training Section supports the development of curricula at the predoctoral level, and research training programs at the postdoctoral level. This provides medical students and physicians-in-training with increased exposure to geriatric patients in a variety of clinical research settings.

A major goal of the Pharmacology Section is to establish optimum drug dosage levels for the elderly, who may respond very differently to a drug than do younger people. Since most pharmacological information has been obtained in young subjects, the possibility of such undesirable complications as adverse drug reactions and interactions must be studied in the elderly.

The Nutrition Section supports investigations on the relation of clinical nutrition to aging, disease prevention, and health maintenance. To date, there are no firm standards for nutritional requirements of the elderly. Research areas include the effects of nutritional status on metabolic processes and physiologic function. This program seeks to understand the effects of diet in the elderly and to improve health through dietary modification.

The Endocrinology Section focuses on the causes and consequences of such age-related endocrine changes as menopause and benign prostatic hypertrophy.

The Dermatology Section supports studies in gerontological and geriatric dermatology in disciplines ranging from basic molecular and cellular biology to physiology and clinical medicine.

Behavioral Sciences Research

Aging involves complex interactions among biological, psychological, and societal processes. The NIA extramural research program in behavioral sciences supports studies to increase understanding of how health, effective functioning, and well-being of older people are affected by personal and environmental factors. The goals are to prolong the productive and healthy middle years of life and to prevent or reverse such decrements of old age as memory loss, chronic ill health, sensory deficits, low self-esteem, or withdrawal from active participation in social and economic roles. Insofar as these goals can be attained, the elderly will have the potential to remain healthy and active and minimize any dependence.

Research now indicates that aging processes and the status of the elderly are not inevitably fixed, but are subject to social modification and change. Studies have shown that people in different societies or in different historical periods age in different ways. This knowledge gives researchers the impetus to explore how particular personal and societal conditions influence aging. Researchers are finding that the stereotype of universal and inevitable deterioration with aging has little scientific basis, that human competence extends far beyond the average age of retirement, and that intellectual and physical declines can often be reversed, even at the oldest ages.

Various activities are designed to specify in detail how behavioral and societal processes, interacting with biomedical processes, influence particular aspects of health and functioning as people age. Research areas include, for example: stress and coping; accident prevention; psychosocial factors in nutrition, exercise, senile dementia, menopause, and hypertension (in coordination with the Biological Research and Clinical Medicine Program); health behaviors and attitudes; productivity, work, and retirement; health care in institutions and the home; as well as methodologies of research examining linkages between psychosocial and biomedical aging processes.

In addition, behavioral sciences research is concerned with psychological, cultural, societal, and economic factors that affect both the process of growing old and the place of older people in society. This program highlights the dynamic character of aging as a product of social and historical change, the interrelatedness of old age with earlier ages, and the variability of aging resulting from socioenvironmental and cultural influences on the aging process and the lives of older people. The program draws upon three broad categories of research as listed below.

Cognitive and Biopsychological Aging. This cluster concerns the identification and specification of cognitive, intellectual, and perceptual changes and stabilities that, interacting with biological

and social processes, occur with aging.

Social Psychological Aging. Studies focus on changes that occur with aging in health, behavior, personality, and attitudes of people as related to the social environment.

Older People and Society. This program cluster concerns the changing societal and cultural conditions that affect people in their middle and later years in respect to mortality, the burden of illness, socioeconomic status, needs and attitudes, and the opportunity to lead productive lives. Research also involves how, and with what consequences, people are influenced by the intricate network of institutions in which they grow old: families, households, work organizations, educational and religious institutions, political institutions, and health and welfare institutions.

John E. Fogarty International Center for Advanced Study in the Health Sciences

Mission*

The John E. Fogarty International Center for Advanced Study in the Health Sciences, established in 1968:

- provides the facility for the assembly of scientists and leaders in the biomedical, behavioral, and related fields for discussion, study, and research relating to the development of science internationally as it pertains to health and its implications and applications for the future;
- furthers international cooperation and collaboration in the life sciences through its research programs, conferences, and seminars;
- provides postdoctoral fellowships for research experience in the United States and abroad and promotes senior scientist exchanges between the United States and other countries;
- coordinates NIH activities and functions generally concerned with the health sciences at an international level; and
- serves as a focal point for foreign visitors to the National Institutes of Health.

Federal Register, Vol. 33, No. 53: March 16, 1968.

Important Events in FIC History

January 18, 1967—Representative Melvin Laird (Wis.) proposed to Congress to establish an international research and study center at NIH as a memorial to the late Representative John E. Fogarty (R.I.). Subsequently President Lyndon B. Johnson announced that he was seeking funds for the establishment of the John E. Fogarty International Center for Advanced Study in the Health Sciences.

February 26, 1968—Departmental approval was given to the Fogarty International Center.

March 16, 1968—Official notice was published in the *Federal Register.*

June 16, 1968—Milo D. Leavitt, Jr., M.D., was appointed the first Director of FIC.

July 1, 1968—FIC became operational. The NIH Office of International Research was abolished and several of its functions were transferred to FIC.

April 28, 1971—A bronze sculpture of John E. Fogarty, commissioned and dedicated by Mrs. Mary D. Lasker, was presented to NIH.

July 1978—Leon Jacobs, Ph. D., was appointed Director.

June 1979—The Task Force to Assess the Missions and Functions of the Fogarty International Center reported to the Director, NIH, on its year-long study of the Center, reaffirming FIC's importance as the focus for international aspects of biomedical and behavioral research at NIH, and recommending specific measures for strengthening and broadening its programs.

July 1979—Edwin D. Becker, Ph. D., was appointed Acting Director.

April 28, 1980—Vida H. Beaven, Ph. D., was appointed Acting Director.

March 16, 1981—Claude Lenfant M.D., Acting FIC Director since January 1981, was appointed FIC Director, and NIH Associate Director for International Research.

June 1982—FIC was designated a WHO collaborating center for research and training in biomedicine.

July 1982—Mark S. Beaubien, M.D., was appointed Acting FIC Director and Acting NIH Associate Director for International Research.

January 1984—Craig K. Wallace, M.D., was appointed FIC Director and NIH Associate Director for International Research.

Biographical Sketches of FIC Directors

Milo D. Leavitt, Jr., M.D.
Dr. Leavitt was born June 24, 1915, in Beloit, Wisconsin. He received an A.B. degree from the University of Wisconsin in 1938, an M.D. from the University of Pennsylvania in 1940, and an M.P.H. from Harvard University in 1959. From 1942 to 1945 he was in the U.S. Army Medical Corps.

Entering the PHS in 1959, he served as chief of the Project Services Branch, Collaborative Research, NINDB, until 1962, when he was appointed head of the Special International Programs Section, Office of International

Research. In 1966 he assumed the position of Deputy Assistant Secretary for Science and Population, DHEW.

Dr. Leavitt returned to NIH as deputy chief, Office of Program Planning, in 1967. On June 16, 1968, he was appointed Director of FIC. He left FIC in July 1978 to become assistant to the NIA Director, Medical Program Development and Evaluation. He retired from Federal service in December 1982 and died on January 12, 1983.

Leon Jacobs, Ph. D.
Dr. Jacobs was born in Brooklyn, New York, in 1915. He received his M.A. and Ph. D. degrees from George Washington University in 1938 and 1947. He has written numerous articles on parasitology, his specialty, and is a member of many scientific organizations. He has served as editor of several journals, including the *Journal of Parasitology*. From 1946 to 1966 Dr. Jacobs held various positions in NIAID, serving as acting scientific director from 1964 to 1965. For the next 2 years, he was Deputy Assistant Secretary for Science, DHEW.

He returned to NIH as assistant director for collaborative research in 1969. He served as Associate Director for Collaborative Research, NIH, from 1972 to 1978. On July 1, 1978, he became Director, FIC.

Among the honors he has received are the Arthur S. Flemming Award of the Junior Chamber of Commerce, a Fulbright Scholarship, a Guggenheim Fellowship, the PHS Distinguished Service Medal, and the DHEW Superior Service Award.

Dr. Jacobs retired on June 29, 1979, following 42 years of Federal service. In recognition of his long, distinguished career, he was appointed scientist emeritus by NIAID. Since March 1, 1983, he has served as president of the Gorgas Memorial Institute.

Edwin D. Becker, Ph. D. (Acting)
Dr. Becker was born in Columbia, Pennsylvania, in 1930. He received a B.S. degree from the University of Rochester in 1952 and a Ph. D. from the University of California in 1955. In 1961 he became chief of the Section on Molecular Biophysics, NIAMDD. He was named Acting Director, FIC, in July 1979, while continuing to serve as chief of the Laboratory of Chemical Physics, NIAMDD, a position he assumed in 1972. He has been editor of *Nuclear Magnetic Resonance Abstracts* since 1975 and serves on the editorial boards of several other journals.

He received the Coblentz Memorial Prize in Chemical Spectroscopy in 1966, the Washington Academy of Sciences Award in Physical Sciences in 1971, and the DHEW Superior Service Honor Award in 1973. In April 1980 Dr. Becker assumed the post of NIH Associate Director for Research Services.

Vida H. Beaven, Ph. D. (Acting)
Dr. Beaven was born June 2, 1939, in Bluefield, W. Va. She received bachelor's and master's degrees in microbiology at Indiana University in 1961 and 1962. After a year at the University of London, she studied at George Washington University, where she received her Ph. D. in 1968.

She returned to NHLBI, where she had done her predoctoral research for 3 years as a staff fellow. After a year as a grants associate, DRG, she was appointed special assistant to the associate director for extramural programs, NIAMDD. In 1973 she was appointed biomedical health programs adviser in the Office of the HEW Assistant Secretary for Health. She served as assistant to the executive secretary and later as executive secretary of the HEW Secretary's Review Panel on New Drug Regulation.

In November 1976, Dr. Beaven again returned to NHLBI as special assistant to the director. A year later she was named special assistant to the NIH Deputy Director. After serving as head of the staff of the Task Force to Assess the Missions and Functions of the FIC, Dr. Beaven succeeded Dr. Becker as Acting FIC Director in April 1980.

She returned to the position of special assistant to the NIH Deputy Director in January 1981.

Claude Lenfant, M.D.
Dr. Lenfant was born in Paris, France, in 1928. After receiving his M.D. degree from University of Paris in 1956 and completing his residency training, he held several appointments in experimental surgery and physiology in academic institutions in Lille and Paris. In the United States, he pursued postdoctoral work at both University of Buffalo and Columbia University, and in 1961 joined the faculty of University of Washington, Seattle. He was professor of medicine and professor of physiology and biophysics when he left the university in 1970.

In that year, he came to the NIH to build a program in the area of lung diseases. He served as director of the Division of Lung Diseases, NHLBI, from 1972 to 1981. His contributions to the scientific literature include more than 130 papers and editorship of a 21-volume series of monographs on *Lung Biology in Health and Disease*.

In 1981 Dr. Lenfant became Director of the Fogarty International Center and NIH Associate Director for International Research.

He returned to NHLBI in July 1982 to become Institute Director.

Mark S. Beaubien, M.D. (Acting)
Dr. Beaubien was born in Chicago, Ill., on October 20, 1921. From the

University of Chicago, he received his B.S. in 1944 and his M.D. in 1946.

He received training in the Canal Zone, the Philippines, and at CDC in Atlanta, Ga. From 1952 to 1957 he was employed as a staff physician in internal medicine at Henry Ford Hospital in Detroit, Mich. He then went into private practice.

In 1962, Dr. Beaubien joined the U.S. Public Health Service, in which he is a commissioned officer, and has served in a variety of capacities and countries. Among these were Peace Corps medical program assignments in East Pakistan and Malaysia and USAID appointments in Vietnam and Thailand. In 1968 he received a PHS Meritorious Service Medal and an AID Vietnam Service Award.

Immediately prior to coming to the Fogarty Center in 1971, he was associate director for professional resources at the Office of International Health, PHS. While serving as assistant chief of the International Coordination and Liaison Branch, FIC, from 1978 to 1982, he was awarded a PHS Commendation Medal.

On July 1, 1982, Dr. Beaubien was appointed Acting FIC Director and Acting NIH Associate Director for International Research. He served in these capacities until 1984, at which time he was appointed FIC deputy director.

Craig K. Wallace, M.D.

Dr. Wallace was appointed FIC Director and NIH Associate Director for International Research January 19, 1984. A former captain in the U.S. Navy, he came to the NIH from Cairo, Egypt, where he was commanding officer of Naval Medical Research Unit No. 3.

Prior to serving at NAMRU-3, he was director of clinical services at the Naval Regional Medical Center in Jacksonville, Florida, and chief of internal medicine at the Naval Regional Medical Center in Camp Pendleton, California. His military professional experience since 1972 includes service in Ethiopia as well as in the United States.

Dr. Wallace was born December 4, 1928, in Woodbury, New Jersey. He received his B.A. degree from Princeton University in 1950 and his M.D. degree from New York Medical College in 1955. He did his internship and internal medicine residency at Jefferson Medical College Hospital in Philadelphia.

After spending 3 years at NAMRU-2, Taipei, as a clinical investigator, he joined the staff of Johns Hopkins University in 1964. During his 8-year affiliation with that institution, he was an associate professor of medicine. This included 2 years as resident coordinator of the Johns Hopkins University Center for Medical Research and Training in Calcutta, India.

In the course of his naval career, he received the Meritorious Service Medal, Navy Commendation Medal, and Armed Forces Reserve Medal.

Dr. Wallace has a special interest in international medical research, particularly in the area of tropical diseases. He is a member of numerous professional societies and has held many consultant appointments.

Major Programs

Advanced Studies

The Fogarty International Center contributes to advanced studies in the health sciences through three interrelated programs with the same goal: bring the knowledge and ideas of experts to bear on the identification of health-related issues of international importance and concern, and develop strategies that will have a worldwide impact on disease prevention.

The FIC Scholars-in-Residence Program provides the opportunity for well-established scientists and scholars interested in issues of international health to spend up to 10 months at the NIH to exchange information and ideas, and participate in research in an environment conducive to innovative advanced studies. Scholars may engage in individual study toward preparation of a book, monograph, or other report, may collaborate with NIH scientists in laboratory research, and are expected to arrange conferences or seminars with other scholars and with scientists whose interests are similar or complementary.

Nominations for scholars-in-residence, which may be submitted by NIH scientists or former Fogarty scholars, are reviewed by a panel of intramural NIH scientists. Approved nominees are invited by the FIC as openings become available.

The FIC International Studies Program was established to address international aspects of biomedical and behavioral research, research manpower training, and transfer of research results.

The program fosters advanced studies in health sciences through meetings where biomedical and behavioral scientists from various parts of the world can share knowledge, ideas, and concerns about international health. The Center supports intramural conferences initiated by Fogarty scholars or FIC staff, and may contribute to support international aspects of intramural conferences arranged by NIH scientists if the topic is of interest to the FIC.

Fellowships

Fellowship programs administered by the FIC enable foreign scientists to pursue their research

interests in U.S. laboratories and, conversely, provide opportunities for U.S. researchers to work in foreign laboratories. The International Research Fellowship (IRF) Program enables promising postdoctoral biomedical or behavioral scientists from foreign countries to gain further research experience by working in the laboratory of a distinguished U.S. scientist on a problem of mutual interest. A fellowship application is first reviewed by a nominating committee in the prospective fellow's country. If recommended by the foreign nominating committee, it is evaluated for technical merit by an NIH study section. Approved applications are selected for funding and administered by the FIC. Fellows must provide written assurance from an institution in the home country that there is a position to which they can return upon completion of the fellowship.

Two fellowship programs administered by the FIC but supported by other NIH Institutes have eligibility requirements similar to the IRF. The Neurosciences Fellowship Program, jointly sponsored by the NINCDS and WHO, is intended to improve skills in all branches of the neurosciences, but initially stresses convulsive disorders (epilepsy) and cerebrovascular disorders (stroke). The International Tropical Diseases Research Fellowship Program, jointly sponsored by the NIAID and WHO, emphasizes malaria, schistosomiasis, filariasis, trypanosomiasis, leishmaniasis, and leprosy.

The Senior International Fellowship (SIF) Program is for U.S. researchers well recognized and established in their careers who wish to spend up to a year in a foreign laboratory pursuing a project of mutual interest to the fellow and the foreign host scientist. A candidate must be a full-time staff member of the nominating institution. After evaluation for technical merit by an NIH study section, approved applications are reviewed for program relevance and funding by the FIC, which also administers the awards. A limited number of SIF's are offered by NIH Institutes that wish to stress research in special fields, but the number of such awards varies from year to year.

Several foreign countries support fellowships that enable U.S. biomedical researchers who hold doctoral degrees to spend up to a year in a foreign research laboratory. The FIC is involved in the initial stages of these programs but the funding and administration is by the foreign country. The FIC publicizes the availability of post-doctoral research fellowships from the Academy of Finland, French National Institute of Health and Medical Research, the Irish Medical Research Council, the Israeli Ministry of Health, the Norwegian Council for Science and the Humanities, the Swedish Medical Research Council, and the Swiss National Science Foundation. The FIC also arranges for receipt and technical merit review of applications and transmits the applications and reviewers' comments to the awarding country for final selection.

Additionally, FIC announces the availability of postdoctoral fellowships from the Alexander von Humboldt Foundation in the Federal Republic of Germany, and the National Science Council in Taiwan.

International Coordination and Liaison

These FIC activities serve as an operational and coordinating link between foreign countries and NIH Institutes and Divisions, other U.S. agencies, and international organizations concerned with problems of world health.

Bilateral agreements with foreign countries, negotiated by the State Department, are an important channel for establishing international collaboration in health-related research and information dissemination. At present, the NIH participates in 55 bilateral agreements with 32 countries. Further, the FIC has lead PHS responsibility for bilateral agreements with nine countries: Belgium, France, Federal Republic of Germany, Hungary, Japan, Poland, Romania, Venezuela, and Yugoslavia.

The FIC manages all PHS individual exchanges of U.S. and foreign health scientists who wish to collaborate in research. These scientists are jointly supported through agreements the U.S. has with five Eastern European countries and France.

Foreign Scientists Assistance

The FIC provides support for the NIH Visiting Program and the NIH Foreign Guest Researcher Program. Both provide opportunities for distinguished foreign scientists at all levels of their career to work with senior NIH investigators on problems of mutual interest.

The FIC provieds trans-NIH administrative and immigration services to the NIH intramural research program concerning awards and appointments and related matters pertaining to foreign scientists in the NIH Visiting Program and Guest Researcher Program. Special experts, exchange scientists under bilateral agreements, foreign patients in the Clinical Center, and the dependents of these several categories are also assisted by the FIC.

Other Responsibilities

Under the WHO Collaborating Center for Research and Training in Biomedicine, opportunities are provided to influence health

problems of global importance by increasing interaction between the NIH, the WHO, the Pan American Health Organization (PAHO), the Centers for Disease Control, and the Agency for International Development.

As the NIH focus of international activities, the FIC has both an integrative and administrative role in activities supported by other PHS components and other Federal agencies. The FIC is the NIH representative in maintaining liaison with such international organizations as the WHO, PAHO, the European Economic Community, and the European Medical Research Council.

The FIC Director meets periodically with international representatives of the NIH Bureaus, Institutes, and Divisions to exchange information and views on NIH international activities and to discuss implementation of related policies and procedures. The FIC also assists BID's by interpreting DHHS and State Department procedures relating to international travel, serving as a channel for communications to and from foreign embassies, and coordinating responses to inquiries on international issues. Data are collected and published by the FIC annually on the overall status of NIH international activities.

The FIC also administers the Special Foreign Currency Program. Under this program, NIH intramural scientists and scientists in U.S. academic and nonprofit research institutions work with scientists in foreign institutions on a) collaborative biomedical research of mutual interest to both countries and b) translation, documentation, and critical reviews of health science information.

The FIC also serves as the administrative channel through which funds appropriated by the Congress are made available to the Gorgas Memorial Laboratory in Panama. Since 1929 this laboratory has conducted research in tropical diseases of importance to the U.S. and Panama.

Division of Computer Research and Technology

Mission

The Division of Computer Research and Technology has primary responsibility for incorporating the power of modern computers into biomedical programs and administrative procedures of NIH. DCRT serves as a scientific and technological resource for other parts of PHS, and for other Federal organizations with biomedical and statistical computing needs. In addition, DCRT:

- Provides consulting and collaborative services on mathematical, statistical, engineering, and computer science and technology matters;
- Designs, develops and installs small computer systems for specialized laboratory and clinical applications;
- Conducts independent research and development projects in its own laboratories and branches in support of its scientific and technological resource function;
- Operates the NIH central computer facility, and provides training and technical documentation/ information assistance to its registered users;
- Coordinates automatic data processing policy and reporting at NIH.

Important Events in DCRT History

1954—A central data processing facility was established in Office of the Director, NIH, under Dr. Harold Dorn, combining EAM (punched card) equipment and biometric expertise.

1956—In January the biometric facility became the Biometrics Branch in the new Division of Research Services; in May the NIH Director established a Committee on Electronic Data Processing and Computers.

1958—NIH installed its first electronic digital computer, an IBM 650, as an experimental device.

March 8, 1960—The Surgeon General approved establishment of a Computation and Data Processing Branch in the Division of Research Services.

October 1961—NIH installed its first "second generation" computer.

April 25, 1962—The Director, NIH, appointed a steering committee to undertake a comprehensive study of data processing activities at NIH.

April 1963—The NIH steering committee recommended the establishment of a Division of Computer and Information Sciences (subsequently changed to DCRT), including provision for the transfer of the Computation and Data Processing Branch, DRS, to the new organization.

April 16, 1964—The Department approved establishment of DCRT.

June 22, 1965—As a result of a joint NBS/NIH study of NIH data processing requirements, a contract was awarded for conversion of the NIH computer system from second- to third-generation equipment.

April 1, 1966—The first components of the third-generation computer system were installed.

August 1, 1966—Dr. Arnold W. Pratt was appointed as the first Director of DCRT.

January 1, 1967—DCRT was reorganized with the establishment of the Laboratory of Applied Studies, the Computer Systems Laboratory and the Physical Sciences Laboratory in addition to the Computation and Data Processing Branch. A Heuristics Laboratory was established later in the year.

December 20, 1968—The Computation and Data Processing Branch was subdivided into the Computer Center Branch and the Data Management Branch.

April 1969—First time-sharing computers went into service for the NIH research community.

June 1969—Minicomputers designed by DCRT were first installed in NIH laboratories.

July 1974—The Laboratory of Statistical and Mathematical Methodology was established, combining disciplines from several parts of DCRT.

May 31, 1979—An interagency agreement between HEW and GSA established the general-purpose portion of the NIH Central Computer Utility at DCRT as a Federal Data Processing Center for biomedical and statistical computation.

April 1983—The Personal Workstation Project (PWP) was established to determine how effectively personal computers could be used at NIH.

May 1984—PWP became the Personal Workstation Office (PWO), established to guide and support the use of personal computers throughout NIH.

Biographical Sketch of DCRT Director

Arnold W. Pratt, M.D.

Dr. Pratt, the first Director of DCRT, was appointed in August 1966, 2 years after the Division was established. He came to DCRT from NCI, which he joined in 1948 as head of the Energy Metabolism Section in the Laboratory of Physiology. His research at NCI led him to investigate a number of biomedical research areas to which computers might be applied. He subsequently published several papers on computational analysis of ultraviolet absorption spectra and the use of computers in cancer chemotherapy.

He is internationally known for his research in computational linguistics and has published extensively in his field. Additionally, his expertise in computer research and its application to medicine has made him widely sought as a guest lecturer both nationally and internationally.

Born in Binghamton, N.Y., in 1920, Dr. Pratt is an alumnus of Hobart College and received his medical degree from the University of Rochester School of Medicine in 1946. He served on the staff of the New York Hospital from March 1946 to July 1947. While a research associate at Cornell Medical School for 1 year, Dr. Pratt was a resident physician at the Protestant Children's Service.

His honors and awards include: a DHEW Superior Service Award in 1968; an honorary doctor of science degree in 1973 from Hobart and William Smith Colleges, Geneva, N.Y.; and a Meritorious Executive Presidential Rank Award for the Senior Executive Service in 1980.

Dr. Pratt is on the editorial board of three journals: *Computers and Biomedical Research, Computer Programs in Biomedicine,* and *Methods of Information in Science.* He is a member of the American Association for the Advancement of Science.

DCRT Research, Development, and Service

DCRT programs focus on three primary activities: conducting research, developing computer systems, and providing computer facilities.

Computer Center Branch staffs, maintains and operates the Central Computer Utility and its associated online terminal devices in support of all NIH programs.

Data Management Branch provides systems analysis and programming expertise for development of easily accessible, effective, efficient data management and analysis capabilities on the central NIH computer facilities.

The Laboratory of Statistical and Mathematical Methodology develops theory and provides computer-based statistical and mathematical methods for NIH scientists and managers.

The Computer Systems Laboratory provides NIH biomedical researchers and administrators consulting, engineering and programming assistance for the design and implementation of specialized computer systems for laboratory automation, patient monitoring and other applications.

The Laboratory of Applied Studies applies mathematics, statistics, and computer sciences to biomedical problems in collaboration with NIH scientists.

Physical Sciences Laboratory personnel analyze biological phenomena in terms of theoretical physics and chemistry.

Warren Grant Magnuson Clinical Center

Mission

The Warren Grant Magnuson Clinical Center is staffed and equipped to ensure the highest

possible level of medical care to each patient; provide optimal resources and facilities for clinical research; perform research on methods and systems involved in patient care and study; disseminate information to professionals and to the public relevant to clinical investigation; develop and maintain training programs in the techniques and ethics of biomedical and clinical research; and interact with scientists and physicians, nationally and internationally, on mutual problems of clinical research such as policy, education, ethics, and priorities.

The CC was authorized by Congress to provide high-quality patient care necessary to conduct biomedical research. The 540-bed hospital has facilities and support services for nearly 1,000 physicians who conduct clinical research for 9 of the 11 NIH Institutes and for the National Institute of Mental Health (NIMH). It was specially designed to place patient care facilities close to research laboratories to promote the quick transfer of new findings of basic and clinical scientists to the treatment of patients. Institutes admit to their units only those patients (upon referral by personal physicians) who have the precise kind or stage of illness under investigation by scientist-clinicians.

CC departments are responsible for the hospital services, except for direct physician care, and conduct research in their own specialities.

In addition to biomedical research and patient care, the CC offers opportunities for advanced training to young physicians, medical students, nursing students, and members of the paramedical professions. This training includes a graduate and postgraduate program, a clinical electives program, and many lecture series. The monthly combined clinical staff conferences present the results of the cooperative biomedical research carried out at the CC by the scientists and clinicians of one or more of the Institutes and CC departments.

Important Events in CC History

November 1948—Construction of the Clinical Center was started.

June 22, 1951—The cornerstone ceremony was officiated by Oscar R. Ewing, Federal Security Administrator. President Harry S. Truman was the honored guest.

July 2, 1953—The Clinical Center was dedicated by DHEW Secretary Oveta Culp Hubby.

July 6, 1953—The first patient was admitted to the Clinical Center.

September 5, 1963—A new surgical wing for cardiac and neurosurgery was dedicated by Luther L. Terry, M.D., PHS Surgeon General.

July 2, 1969—A dedication ceremony was held to name the Clinical Center's first floor auditorium the Jack Masur Auditorium.

April 1977—Construction of the Ambulatory Care Research Facility (ACRF) was started.

October 22, 1981—The ACRF and Warren Grant Magnuson Clinical Center were dedicated.

September 20, 1982—The National Institute on Aging Laboratory of Neurosciences was dedicated by Drs. Neal R. Cutler, deputy clinical director, Stanley Rapoport, chief, and Jay Shapiro, Acting CC Director.

February 7, 1984—The National Institute of Alcohol Abuse and Alcoholism nursing unit opened.

CC Legislative Chronology

July 1, 1944—Public Law 78-410, the Public Health Service Act, authorized establishment of the Clinical Center.

July 8, 1947—Under P.L. 80-165, research construction provisions of the Appropriations Act for FY 1948 provided funds "For the acquisition of a site, and the preparation of plans, specifications, and drawings, for additional research buildings and a 600-bed clinical research hospital and necessary accessory buildings related thereto to be used in general medical research. . . ."

Biographical Sketches of CC Directors

Jack Masur, M.D.
Dr. Masur served as Director of the CC from 1948 to 1951, during the planning and construction of the laboratory research hospital.

John A. Trautman, M.D.
Dr. Trautman was CC Director from July 1, 1951, to June 24, 1954. Prior to his tenure at the CC, he directed the PHS Staten Island facility, a 985-bed general hospital. Later, he was chief of its department of dermatology and syphilology.

He entered PHS in 1939, serving his internship at the Chicago Marine Hospital. Thereafter he was assigned to various PHS facilities.

Upon leaving the CC in 1954, Dr. Trautman assumed the position of medical officer in charge of the PHS hospital in Fort Worth, Tex. He retired from PHS in 1964.

Donald W. Patrick, M.D.
Dr. Patrick was CC Director from June 23, 1954, to October 30, 1956. From 1945 to 1954, he had served as medical officer in charge of PHS hospitals in Evansville, Ind.; Detroit; and Baltimore.

A native of Denver, Colo., he received his M.D. from the University of Colorado in 1930. After interning at New Orleans Hospital, he was commissioned in PHS in 1931. He joined the NIH staff in 1935, and was assigned to the Leprosy Investigations Service at the Kalihi Hospital in Honolulu, Hawaii.

After leaving the CC in 1956, Dr. Patrick served as medical director of the PHS hospital in San Francisco until his retirement on August 1, 1962. He maintained his interest in PHS activities until his death in 1966.

Jack Masur, M.D.
Dr. Masur was reappointed CC Director November 1, 1956, and served until his death in March 1969. In addition to directing the research hospital, he was NIH Associate Director for Clinical Care.

He was internationally known in the areas of hospital administration, planning, and construction. As chief of the Bureau of Medical Services from 1951 to 1956, he directed the medical care programs of the PHS by administering its hospitals and other facilities including Freedmen's Hospital in Washington, D.C.

Before joining the PHS in 1943, Dr. Masur had been executive director of Lebanon Hospital and assistant director of Montefiore Hospital, both in New York City. He was a graduate of New York University and Cornell University Medical School. He served his internship at Bellevue Hospital and residency in medicine at Montefiore Hospital.

Thomas C. Chalmers, M.D.
Dr. Chalmers was NIH Associate Director for Clinical Care and Director of the CC from February 8, 1970, to October 20, 1973.

He came to the CC from the Veterans Administration in Washington, D.C., where he had been assistant chief medical director for research and education. Prior to his tenure there, he was chief of medical services at Lemuel Shattuck Hospital, Boston, from 1955 to 1968.

A native of Forest Hills, N.Y., Dr. Chalmers attended Yale College and received his M.D. from Columbia College of Physicians and Surgeons. He interned at Presbyterian Hospital in New York City and served fellowships and residencies at New York University and Harvard Medical School. He also served at Boston City Hospital, Harvard Medical Services, Thorndike Memorial Laboratory, and the Army Medical Graduate School.

He published widely in the field of gastroenterology and on the use of controlled clinical trials to evaluate drugs and therapeutic techniques.

Dr. Chalmers left the CC to become president of the Mount Sinai Medical Center and dean of Mount Sinai School of Medicine of the City University of New York.

Robert S. Gordon, Jr., M.D.
Dr. Gordon was NIH Associate Director for Clinical Care and Director of the CC from January 7, 1974, to September 1, 1975.

He joined NIH in 1951 serving first with the National Heart Institute in various positions including senior investigator in the Laboratory of Metabolism and chief of clinical research for the Pakistan-SEATO Cholera Research Laboratory in Dacca, East Pakistan (now Bangladesh). He was clinical director, National Institute of Arthritis and Metabolic Diseases, from 1964 to 1974.

A native of New York City, Dr. Gordon earned his M.D. from Harvard Medical School and served an internship and residency at Presbyterian Hospital in New York.

He made major contributions to better understanding of fat transport and metabolism as related to prevention of premature arteriosclerosis. He received the Stouffer Prize in 1972 for his work on the isolation and origin of free fatty acids, their hormonal control, and importance as a source of energy.

Dr. Gordon left the CC to take a position as visiting professor in the department of social and preventive medicine, University of Maryland Medical School, and Johns Hopkins School of Hygiene and Public Health in Baltimore. He has since returned to NIH as Special Assistant to the Director, NIH.

Mortimer B. Lipsett, M.D.
Dr. Lipsett was NIH Associate Director for Clinical Care and CC Director from August 1976 to July 1, 1982.

Before his appointment he was director of Cancer Center, Inc., a cancer research, training, and patient care facility in Cleveland, Ohio, and professor of medicine at Case Western Reserve University.

Dr. Lipsett first came to NIH in 1957 and served in the National Cancer Institute's Endocrinology Branch. He was branch chief from 1966 to 1970, when he was appointed associate scientific director, NICHD. During this time he also was chief of NICHD's Reproduction Research Branch until he left NIH in 1974 to join Cancer Center, Inc.

He received his M.D. from the University of Southern California in 1951. Following an internship at Los Angeles County Hospital and residency at the Sawtelle VA Hospital in Los Angeles, he was a postdoctoral USPHS fellow and subsequently a staff member of the Sloan-Kettering Institute, New York, before coming to NIH.

Honors accorded Dr. Lipsett include the Alfred P. Sloan Award for Cancer Research (1955), the DHEW Superior Service Honor Award (1969), and the Distinguished Leadership Award of the Endocrine Society (1976). In April 1980, he delivered the first annual Peter Kiewit Distinguished Lectureship in Medicine at the Eisenhower Medical Center. He received a Senior Executive Performance Award in 1980 and a

DHHS Distinguish Service Award in 1981.

Dr. Lipsett left the CC to become NICHD Director in July 1982. On January 7, 1985, he was appointed NIADDK Director.

John L. Decker, M.D.
Dr. Decker was appointed CC Director on August 1, 1983. Prior to coming to the Clinical Center, he was chief of the Arthritis and Rheumatism Branch, NIADDK.

A native of New York and the son of missionary parents, he grew up in China. He returned to the United States for his education, and received his M.D. from Columbia University College of Physicians and Surgeons in 1951. From 1951 to 1955, he fulfilled his internship and residency requirements at Presbyterian Hospital in New York. He was then awarded a research fellow in medicine from Harvard University and Massachusetts General Hospital where he received training in rheumatology.

For 7 years, Dr. Decker served as a member of the faculty at the University of Washington, and in 1965, accepted his first position at NIH as a branch chief with NIADDK.

His studies in rheumatic diseases have earned him international recognition. He received the Philip Hench Award from the Association of Military Surgeons in 1972; the NIH Director's Award in 1977; and received the Alessandro Robecchi International Prize for Rheumatology Research on nephritis of systemic lupus erythematosus in 1983.

Since 1959, Dr. Decker has authored and coauthored numerous scientific articles on rheumatic diseases. He has served on the editorial boards of major medical publications and is associate editor of the *American Journal of Medicine.* He is a member of the major professional societies and is a former president of the American Rheumatism Association.

Major Programs

Medical Staff Fellowship Program. Physicians and dentists embarking on biomedical research careers can participate in a graduate training program at the NIH. The Medical Staff Fellowship Program accepts about 125 highly qualified individuals each year for 2- or 3-year appointments. Fellows work with senior investigators in clinical or basic research in the CC.

The program offers clinical, research, and pharmacology appointments with the various Institutes. A fellow provides patient care and participates in clinical and laboratory research under the direction of a senior member of the staff. Other medical staff fellows devote most of their time to laboratory research in a biomedical science. Fellows are generally trained in a broad range of research procedures and guided toward independent investigation. Medical staff fellows in the National Institute of General Medical Sciences are involved in laboratory research and receive training in any of many disciplines related to pharmacology. Dental staff fellows may participate in laboratory and clinical research by treating CC medical and dental patients in the Dental Clinic of the National Institute of Dental Research.

Clinical Elective Program. Clinical electives for medical students are available in geriatrics, anesthesiology, endocrinology-metabolism, genetics, hematology-oncology, immunology, medical-surgical neurology, neurobiology (medical and dental students), clinical dental care, computers, nuclear medicine, critical care medicine, pediatric psychopharmacology, psychopharmacology, surgical oncology and related disorders.

The CC offers a wide range of conferences and clinical rounds for physicians. Over 150 students from 60 medical schools are expected to come to the CC this year.

Summer Research Fellowship Program. This fellowship program offers medical and dental students an opportunity to conduct research under a preceptor's guidance. Students participate in research projects and attend lectures and seminars to enhance education and develop investigative skills. Research opportunities are available in the following Institutes: Cancer; Child Health and Human Development; Eye; Heart, Lung, and Blood; Allergy and Infectious Diseases; Arthritis, Diabetes, and Digestive and Kidney Diseases; Dental Research; Neurological and Communicative Disorders and Stroke; Mental Health; and Alcohol Abuse and Alcoholism.

Since the CC is uniquely a research hospital, it disseminates new findings to the biomedical researchers in this country and abroad. It sponsors speakers, conferences, and working groups and eight combined clinical staff conferences each year. Conference proceedings are published by the *Annals of Internal Medicine.* The CC also produces a number of nursing conferences on the latest advances in nursing. These publications are distributed to nursing schools and other hospitals around the country.

The Ambulatory Care Research Facility was officially dedicated on October 22, 1981, by DHHS Secretary Schweiker. With the addition of the ACRF, the Clinical Center can provide advanced care with a greatly expanded capacity for outpatient research. The facility preserves the proximity of research laboratories to clinical areas which characterizes the CC. The 13-story structure houses admissions, surgery, outpatient clinics and areas for diagnostic

radiology, clinical pathology, and nuclear medicine.

Normal Volunteers Program. At any given time 15 percent of the CC's patients are normal volunteers who participate in many studies. These studies provide clinicians with indices of normal body functions against which abnormal physiology and metabolism can be measured. Various colleges, civic and religious groups sponsor volunteers.

Research Review. The review process was restructured in 1977 to provide a single uniform review of both patient and normal volunteer research protocols. Clinical research subpanels were established within each Institute with membership in accordance with HHS guidelines for the protection of human research subjects. The Human Research Review Panel, advisory to the CC Director, coordinates and guides the work of the several clinical research subpanels.

Medical Information System. A computer-based hospital medical communications system has been installed in the CC to support the hospital's patient care and research activities. The system is used for entry of physician orders and for access to patient information generated by the various CC services such as diagnostic radiology and clinical pathology. The system records medications, vital signs, and other information for later retrieval, display, and printing of reports by appropriate staff members, and for the maintenance of a research retrieval data base.

A medical information retrieval system is also available to NIH researchers. This system was developed for investigators to obtain patient data from service department results (over 35 million tests have been entered), medical records of discharge diagnoses on all inpatients ever seen at the CC, and demographic data acquired at admission. Information may be obtained for printing, microfilm, or on computer tape for further study. Thus, an investigator can make a complex search such as "Find all patients with acute lymphocytic leukemia abnormal electrophoretic scans and abnormal liver function tests." The hospital system is an important source of information to researchers and clinicians.

The Critical Care Medicine Department was established in November 1977 to respond to a mandate from the clinical staff for a modern facility to care for increasing numbers of critically ill patients. A group of critical care physicians, nurses, and technical staff working with highly advanced technology and equipment provide outstanding care for any CC patient with a reversible but serious medical problem. The seven-bed unit performs clinical research in addition to its commitment to care for critically ill patients.

Hospital Epidemiology Service. In October 1979 the Hospital Epidemiology Service was established. Under the CC Director's office, the staff includes a physician, three infection control practioners, and a secretary. The service has implemented a comprehensive infection control program that operates within the guidelines recommended by the Joint Commission on Accreditation of Hospitals. The HES seeks to prevent transmission of nosocomial infections using ongoing educational programs, routine patient surveillance, investigations of outbreaks, institution of isolation precautions, and development of employee health protocols. Additionally, the HES conducts research into the epidemiology, pathogenesis, and prevention of nosocomial infections.

Special Studies. NMR (nuclear magnetic resonance), while a topic in physics and chemistry for quite some time, has only recently been applied to clinical imaging (MRI). Images are similar in format to CT (computerized tomography) but are potentially more useful since they reflect more of the tissue's chemical composition and may be obtained in multiple orientations (rather than just transverse) and are produced without ionizing radiation. Research in the Diagnostic Radiology Department has focused on the development of MRI "contrast" agents to increase the diagnostic content of the images and in the definition and analysis of "optimal" imaging strategies which produce diagnostic studies with a minimum of scanning time. Clinical scanning has primarily been directed to evaluate MRI appearance of diseases relatively unique to NIH and/or which have posed major problems of diagnosis, detection, or followup with the traditional imaging modalities.

Members of the Nuclear Medicine Department, in collaboration with NINCDS, NIA, and NIMH, instituted positron emission tomographic scanning procedures to study brain function in the elderly and in patients with tumor, epilepsy, and other brain diseases, mental disease, and emphysema. Nuclear imaging equipment makes possible the rapid measurement of radioisotope tagged glucose distribution in the brain. Results are analyzed by computer and displayed either as images or as graphs of global or regional cerebral function.

The CC's Department of Transfusion Medicine continues to provide safe and effective blood and blood products for CC patients, including approximately 900 units of whole blood or red cells, and approximately 1,500 units of platelets a month for treatment of patients undergoing

surgery, or with diseases such as aplastic anemia, leukemia, or other malignant conditions. Random and HLA matched platelet transfusions are available as well as specialized products such as granulocyte transfusions, frozen red cells, and fresh frozen plasma.

The department's Blood Bank is also a reference center for transfusion problems referred by laboratories and hospitals throughout the country.

The department continues to investigate the relationship between blood transfusion and hepatitis. Department of Transfusion Medicine staff, in collaboration with NIAID, expanded their studies of non-A non-B hepatitis in an attempt to develop a test for carriers of this virus or viruses and to evaluate any link between elevated ALT levels and disease transmission. Transmission of AIDS by transfusion, apheresis research, and HLA typing represent new areas of activity for the department.

The Pharmacy Department provides a 24-hour comprehensive pharmacy service both for in- and outpatients. Most services are provided from the central pharmacy. These include: 1) purchase and inventory control of drugs, 2) narcotic control and distribution, 3) manufacture and packaging of pharmaceuticals, 4) a unit dose distribution system, 5) an I.V. admixture service, and 6) outpatient drug dispensing. The clinical pharmacy service is staffed by pharmacists with advanced specialty training. These clinical pharmacist specialists assist physicians in designing, monitoring, and evaluating patient drug regimens to assure proper and rational drug therapy. The Clinical Pharmacokinetic Research Laboratory determines and monitors drug levels in patients and interprets patient response to

Normal Volunteers Admitted to the Clinical Center

Year	Number
1954	17
1955	53
1956	68
1957	81
1958	85
1959	100
1960	274
1961	501
1962	477
1963	582
1964	553
1965	501
1966	316
1967	214
1968	218
1969	194
1970	205
1971	268
1972	246
1973	297
1974	433
1975	336
1976	466
1977	477
1978	434
1979	433
1980	372
1981	356
1982	358
1983	572
1984	529
Total	10,016

Source: Information Office, Clinical Center, NIH.

Clinical Center Admissions by Institute

Year	NCI	NEI	NHLBI	NIA	NIAAA	NIAID	NIADDK	NICHD	NIDR	NIMH	NINCDS	Yearly total
1954	323	.....	382	.....	.....	259	129	.....	.....	51	308	1,452
1955	455	.....	481	.....	.....	246	250	.....	6	93	358	1,889
1956	585	.....	615	.....	.....	281	295	.....	40	110	483	2,409
1957	769	.....	788	.....	.....	330	317	.....	26	140	524	2,894
1958	891	.....	889	.....	.....	422	325	.....	47	154	572	3,300
1959	878	.....	1,056	.....	.....	364	376	.....	42	86	650	3,452
1960	881	.....	1,065	.....	.....	381	446	.....	39	127	729	3,668
1961	940	.....	1,015	.....	.....	450	490	.....	38	200	743	3,876
1962	1,068	.....	1,086	.....	.....	423	527	.....	65	204	778	4,151
1963	951	.....	1,018	.....	.....	433	514	.....	53	239	652	3,860
1964	1,172	.....	1,077	.....	.....	391	497	.....	55	233	628	4,053
1965	1,363	.....	1,069	.....	.....	392	447	.....	27	201	602	4,101
1966	1,333	.....	1,085	.....	.....	372	500	67	32	171	612	4,172
1967	1,390	.....	1,102	.....	.....	275	473	.....	35	164	595	4,034
1968	1,442	.....	1,124	.....	.....	311	470	.....	31	177	508	4,063
1969	1,411	.....	1,189	.....	.....	339	436	.....	16	178	515	4,084
1970	1,492	88	1,242	.....	.....	450	416	59	13	197	512	4,469
1971	1,314	117	1,218	.....	.....	413	437	221	22	185	546	4,473
1972	1,320	116	1,226	.....	.....	418	546	246	42	204	453	4,571
1973	1,312	114	1,185	.....	.....	442	577	271	27	184	503	4,615
1974	1,333	130	1,213	.....	.....	467	570	271	6	182	542	4,714
1975	1,608	73	1,395	.....	.....	485	505	311	19	195	560	5,151
1976	2,027	118	1,485	.....	.....	540	527	343	20	248	617	5,925
1977	2,419	102	1,528	.....	.....	680	614	314	16	273	712	6,658
1978	2,877	60	1,491	.....	.....	692	659	321	8	323	645	7,076
1979	2,866	57	1,577	.....	.....	701	678	453	21	291	784	7,437
1980	2,760	66	1,574	.....	.....	742	764	573	19	242	728	7,468
1981	2,690	71	1,542	.....	.....	782	781	681	27	314	692	7,580
1982	2,742	97	1,533	.....	.....	782	827	792	29	317	608	7,788
1983	2,952	148	1,610	161	.....	750	841	920	21	386	607	8,396
1984	3,134	274	1,660	109	30	825	804	931	49	343	651	8,810
Total	**48,698**	**1,631**	**36,520**	**270**	**30**	**14,839**	**16,038**	**6,774**	**891**	**6,612**	**18,417**	**150,720**

Source: Information Office, Clinical Center, NIH

drug therapy. Investigational drug development and trials are important aspects of CC research. It is the formulation, development, control, assay, dispensing, and clinical monitoring of investigational drugs that imparts a uniqueness to the CC's pharmacy program.

The Rehabilitation Medicine Department developed an instructional workbook for patients with rheumatoid arthritis to teach them how to protect their joints and use them in ways that will conserve energy. The workbook is taught in a group setting and behavioral change is measured to evaluate outcome. The department also devised a hand dynamometer to measure flexion, extension, and ulnar/radial deviation of the fingers. This will permit a more accurate quantitative evaluation of hand function.

The Speech Pathology Section, in conjunction with Diagnostic Radiology, has developed a method using ultrasound techniques for measuring tongue motion and swallowing. The use of ultrasound to evaluate muscle bulk has been developed by the medical section.

The Physical Therapy Service in conjunction with the Biomechanics Lab Service is developing methods for analyzing gait while continuing with specialized programs for patients with amputation, lower extremity dysfunction, pain, mastectomy and numerous orthopedic problems. The service has expanded its student training program to a 12 week clinical research internship. Students from nine different universities will intern during the coming year.

The Clinical Pathology Department has recently developed an assay to quantify the magnesium content of mononuclear blood cells. This assay may be an important diagnostic test to assess intracellular magnesium concentration. Less than 1 percent of the total body magnesium is present in plasma and red cells which makes the determination of magnesium in these two body components ineffective in assessing total body magnesium status. This test is now being applied to several different patient populations in which disorders in magnesium metabolism may contribute to the disease process.

In collaboration with the Institutes, studies have documented an elevation of IgD immunoglobulin concentration in patients with AIDS. The significance of this observation for the disease process is being studied. Oligoclonal immunoglobulins have been demonstrated in sera from patients with AIDS by high resolution electrophoresis. Oligoclonal immunoglobulins have also been found in sera of patients with B-lymphocyte malignancies. These findings indicate that similar mechanisms operate in endothelial cells of AIDS patients with Kaposi's sarcoma and malignant B-lymphocyte proliferation such as in patients with lymphomas and chronic lymphocytic leukemias.

The Hematology Service has initiated studies of peripheral blood cells and tissue fluids using a flow cytometer. After a large number of normals were studied, the Hematology Service began to offer evaluation of B cells and T cell subsets to selected CC patients. This tool is helpful in the clinical evaluation of patients with hypogammaglobulinemia, autoimmune diseases, lymphocytosis, and patients with abnormal lymphocyte morphology.

Studies are continung with the patients who have variants of von Willebrand's disease. The importance of carbohydrate to the large multimeric structure of the von Willebrand factor protein is under scrutiny. Studies of normal von Willebrand factor availability at the platelet surface and the platelet receptor for this protein are also being completed.

Division of Research Grants

Mission

Provides staff support to the Office of Extramural Research and Training in the formulation of grant and award policies and procedures.

Assigns applications to the components of the PHS, and to supporting NIH Bureaus, Institutes and Divisions and initial review groups.

Provides for scientific review of NIH grant applications; and advisory and consultative services relating to grant policy and management.

Collects, stores, retrieves, analyzes, and evaluates management and program data needed in the administration of extramural programs.

Disseminates information on extramural programs to the Congress, scientists, and general public.

Important Events in DRG History

1944—Public Health Service Act (P.L. 78–410, sec. 301, July 1) authorized the Surgeon General to "make grants-in-aid to universities, hospitals, laboratories, and other public or private institutions, and to individuals for such research projects as are recommended by the National Advisory Health Council, or, with respect to cancer, recommended by the National Advisory Cancer Council." The act also authorized the award of fellowships in the health sciences.

1946—The Research Grants Office was established January 1 under authority of section 301 of the

Public Health Service Act to administer a number of research projects transferred to PHS from the Office of Scientific Research and Development at the end of 1945. The office was elevated to Division status at end of 1946.

Dr. C. J. Van Slyke was appointed the first chief of the Division.

DRG was assigned responsibility for operating and administering a program of extramural research and training through grants-in-aid of research in the biomedical and health-related sciences (with the exception of cancer research programs operated by NCI). DRG retained the operating responsibility until each successive Institute was established and took over the programs in its categorical fields.

The Division was instructed by National Advisory Health Council to establish study sections for scientific and technical review of research grant applications, and to explore neglected areas of research in the health sciences.

1947—Assigned responsibility for development and administration of the research fellowships program, DRG was renamed Division of Research Grants and Fellowships.

A Central Qualifications Board was formally established August 14 to coordinate review of fellowship applications.

1948—Dr. David E. Price was appointed chief of the Division.

1949—Authority was delegated to DRG May 17 to make awards, and set stipends, allowances, and travel for PHS research fellows (section 202 of the PHS act as amended).

1950—Title was changed back to Division of Research Grants with no change in functions.

1951—Dr. Ernest M. Allen was appointed chief of the Division.

1953—A Research Documentation Section was created for the collection, storage, and retrieval of scientific information resulting from the research grants program.

DRG was awarded the Albert Lasker Award "for outstanding administration of a research grants program, enabling thousands of capable scientists in hundreds of institutions to contribute knowledge substantially advancing the Nation's health."

1956—A Health Research Facilities Branch was established to operate the construction program authorized in the Health Research Facilities Act (P.L. 84-835).

1957—The Grants Review Branch was established to coordinate activities of the 27 study sections then in existence.

1958—Responsibility for research grant and training programs in noncategorical areas, operated by the Division since 1946, was transferred to the new Division of General Medical Sciences.

Following the transfer, the DRG reorganized to concentrate on review of research grant and fellowship applications, coordination of all extramural programs operated by the Institutes and DGMS, and operation of the health research facilities program and grants management.

1959—The Statistics and Analysis Branch was established.

1960—Dr. Dale R. Lindsay was named chief of the Division.

1961—To develop and support independent investigators of high competence, the Research Career Program was initiated. A Career Development Review Branch was established.

The Grants Associates Program began recruitment and training of professional staff for the extramural branches of all granting divisions of PHS, with DRG serving as a primary training focus.

The *Research Grants Index* was published for the first time.

1962—DRG was assigned overall responsibility for coordinating policies and practices for administration of grants and awards for all PHS extramural programs. An Interbureau Advisory Committee was created to coordinate the programs and to assist the Division.

A Policy and Procedure Office, was established in the Office of the Chief to coordinate the review, development, and implementation of PHS policies on grants and awards. Health Research Facilities was transferred to the new Division of Research Facilities and Resources.

1963—Dr. Eugene A. Confrey was named chief of the Division. Codification of PHS policies and regulations led to the publication of a grants manual.

1964—A DRG newsletter was initiated.

Three associate chiefs were added to strengthen management in scientific evaluation, technical communications, analyses of extramural programs, statistical interpretations of grant support, and staff training and orientation.

1965—The Civil Rights Liaison Office was established.

The grants manual was replaced by the "Policy Statement and Guide to Operating Procedures for Research Grants."

DRG expanded its data processing services to include computer-preparation of notices-of-awards and approval lists for research grants.

1966—DRG assumed additional responsibilities for review with the transfer from the Institutes of the Committee on Scientific Publications, the NCI Collaborative Research Panel, the Environmental Sciences Review Committee and the review functions of six panels of the U.S.-Japan Cooperative Medical Science program.

DRG recommended an increase in the responsibility of grantee institutions for scientific and administrative management of research projects approved by the Surgeon General to over 40 additional institutions for 2 years.

The Surgeon General issued the policy and procedure on clinical research and investigations involving human subjects in February. Expanded in July, it required institution-wide assurances to be coordinated and reviewed by DRG. Assurances from most major grantees were received and accepted.

DRG expanded its computerized central data system to include training grants and research career awards in an analogous pattern for research grants, and set up a computer-based record for trainees on training grants and biographical records for research career awardees.

DRG established a General Systems Research Section and Research Operations Support Section under the associate director for research analysis and evaluation. The NIH Central Scientific Classification System for research grants was installed.

1967—An Institutional Relations Office was established.

1968—DRG expanded the computer-based central data system (IMPAC) to include the fellowship programs in addition to research, training grant, and research career award programs.

1969—Stephen P. Hatchett, Ph. D. was appointed Director.

DRG became a part of the Office of the Associate Director for Extramural Research and Training. Grants management function was transferred to the Office of Financial Management in the Office of the Associate Director for Administration.

DRG assumed responsibility for preparation of "Notice of NIH Conferences."

1970—DRG assumed initial review of all FDA applications for research grants.

The Research Analysis and Evaluation Office was given branch status with expanded responsibilities as principal staff resource to DRG and NIH program officials in the analysis and evaluation of the NIH extramural programs.

Responsibility for review of fellowship applications was passed to supporting Institutes and Divisions.

1971—The computer retrieval of information on scientific projects (CRISP) system was designed to provide scientific and associated grant identification information.

Study sections were assigned responsibility for initial review of all new RCDA applications.

1972—An Office of Associate Director for Scientific Review was established to coordinate all DRG activities that impinge on the review process and to assist BID's in devising most effective methods for review of new special emphasis programs.

The Administrative Branch was established incorporating duties of the Internal Operations Branch and other related functions.

The Institutional Relations Section was elevated to branch status.

The Statistics and Analysis Branch was reorganized into Special Projects and Surveys Section, Reports and Data Evaluation Section, and an Office of Systems Planning in the Office of the Chief.

1973—The Career Development Review Branch was abolished. An Office of Research Manpower was established.

Grantee institutions were requested to establish central control offices for distribution of research grant applications to their investigators.

1974—The first receipt date for new individual and institutional postdoctoral research fellowship awards was scheduled for February 1. Review of individual fellowship award applications was assigned to the study sections.

Research Grants Review Branch was abolished. Scientific Review Branch and Referral Branch were established.

Institutional Relations Branch was transferred from DRG to the immediate Office of the Director, NIH, and renamed the Office for Protection From Research Risks.

DRG was assigned responsibility for conducting an ongoing inventory of clinical trials supported by grants and contracts, and NIH intramural research investigators.

1975—Study sections were assigned responsibility for considering animal welfare in review of grant and contract applications with special attention to the Department's Principles for the Use of Laboratory Animals.

DRG developed a computerized tracking system to identify research involving human subjects and to assure compliance by grantee investigators with departmental policy concerning protection of human subjects.

The Study Sections Section, Scientific Review Branch, was abolished. Four new review sections were established under immediate Office of the Chief: Biomedical Sciences, Clinical Sciences, Social and Behavioral Sciences, and Specials.

1976—A new review cycle was established on January 1 for grant and award applications to conform with the new Federal fiscal year (October 1–September 30).

Carl D. Douglass, Ph. D., appointed Acting Director to replace Stephen P. Hatchett (deceased).

The Scientific Review Branch reorganized into four review

sections: Biomedical Sciences, Clinical Sciences, Behavioral and Social Sciences, and Special, each with responsibility for pertinent initial review groups.

1977—Dr. Douglass was appointed DRG Director.

1978—The Behavioral and Social Sciences Review Section was changed to Behavioral and Neurosciences Review Section.

The Extramural Associates Program was established under the Intergovernmental Personnel Act (P.L. 91-648) to promote participation of ethnic minorities and women in NIH-supported research.

1979—DRG chartered four new study sections: Biochemical Endocrinology, Chemical Pathology, Diagnostic Radiology and Nuclear Medicine, and Mammalian Genetics.

The Grants Peer Review Study Team published Phase II of the Report to the Director, NIH. Over 3,000 copies were mailed to those who participated in the opinion poll.

An NIH review scientist registry and consultant file was officially initiated.

1980—DRG was directed to discontinue use of normalized rating scores after the May/June council round.

1981—Eight new study sections were chartered: Behavioral and Neurosciences, Behavioral Medicine, Biomedical Sciences, Bio-organic and Natural Products Chemistry, Clinical Sciences, Experimental Cardiovascular Sciences, Experimental Immunology, and Physical Biochemistry.

A Scientific Review Branch reorganization established three additional review sections: Biological Sciences, Manpower, and Physiological Sciences.

1982—The Hearing Research Study Section was chartered.

1983—The Scientific Review Branch, Referral Branch, and Office of Research Manpower were consolidated into the Referral and Review Branch.

As a result of the congressionally mandated Small Business Innovative Research (SBIR) Program, DRG's responsibilities increased. DRG was the central information source for the small business community, provided the scientific merit review of SBIR applications, and established an SBIR data base for statistical studies and future mailings.

The Respiratory and Applied Physiology Study Section was chartered.

1984—The Research Analysis and Evaluation Branch was abolished. A position of assistant director for special projects was established. The Neurology C Study Section was established.

DRG Study Sections

The following review groups evaluate research grant applications. Their dates of establishment are denoted in parentheses.

Behavioral and Neurosciences Review Section (1978)

—Behavioral Medicine (1981)
—Bio-Psychology (1959)
—Epidemiology & Disease Control (1965)
—Hearing Research (1982)
—Human Development & Aging (1967)
—Neurology A (1953), B (1962) & C (1984)
—Neurological Sciences (1977)
—Sensory Disorders & Language (1962)
—Social Sciences & Population (1971)

Biological Sciences Review Section (1981)

—Bacteriology & Mycology (1958)
—Cellular Biology & Physiology (1958)
—Genetics (1958)
—Mammalian Genetics (1979)
—Microbial Physiology & Genetics (1967)
—Molecular Biology (1967)
—Molecular Cytology (1975)
—Tropical Medicine & Parasitology (1949)

Biomedical Sciences Review Section (1976)

—Allergy & Immunology (1956)
—Biochemistry (1951)
—Bio-organic & Natural Products Chemistry (1981)
—Biophysical Chemistry (1965)
—Diagnostic Radiology (1979)
—Experimental Immunology (1981)
—Experimental Virology (1975)
—Immunobiology (1967)
—Immunological Sciences (1975)
—Medicinal Chemistry (1959)
—Metabolism (1959)
—Metallobiochemistry (1962)
—Molecular and Cellular Biophysics (1955)
—Pathobiochemistry (1975)
—Physical Biochemistry (1981)
—Physiological Chemistry (1959)
—Radiation (1955)
—Virology (1958)

Clinical Sciences Review Section (1976)

—Cardiovascular & Pulmonary (1973)
—Cardiovascular & Renal (1973)
—Chemical Pathology (1979)
—Experimental Cardiovascular Sciences (1981)
—General Medicine A (1957)
—Hematology (1946)
—Nutrition (1959)
—Orthopedics & Musculoskeletal (1963)
—Pathology A (1946) & B (1961)
—Respiratory & Applied Physiology (1983)
—Surgery (1961) & Bioengineering (1977)
—Surgery (1946) Anesthesiology & Trauma (1977)
—Visual Sciences A (1962) & B (1972)

Manpower Review Section (1981)

—Behavioral & Neurosciences (1981)
—Biomedical Sciences (1981)
—Clinical Sciences (1981)

Physiological Sciences Review Section (1981)

—Biochemical Endocrinology (1979)
—Endocrinology (1951)
—Experimental Therapeutics (1972)
—General Medicine B (1965)
—Human Embryology & Development (1955)
—Oral Biology & Medicine (1974)
—Pharmacology (1946)
—Physiology (1946)
—Reproductive Biology (1965)
—Toxicology (1958)

Special Review Section (1976)

Biographical Sketches of DRG Chiefs and Directors

Cassius James Van Slyke, M.D.
Dr. Van Slyke came to NIH in 1946 from the Venereal Diseases Division of PHS where he was assistant chief. In January of that year he became the first chief of the new Research Grants Office, which was elevated to Division status a few months later. He remained with the Division until August 1948 when he was named Director of the National Heart Institute. In November 1952, Dr. Van Slyke was appointed Associate Director of NIH. On December 3, 1958, he became the first Deputy Director of NIH, serving in that position until his retirement on December 1, 1959.

Born in Benton, Minn., on December 1, 1900, Dr. Van Slyke received his medical degree from the University of Minnesota in 1928, and entered the PHS reserve corps the same year.

In 1932 he was commissioned in the regular corps, PHS. From 1936 to 1944, he pursued a distinguished career of experimental research at the PHS Venereal Disease Research Laboratory at Staten Island, N.Y.

Dr. Van Slyke received a Lasker Award from the American Public Health Association in 1957. He died April 21, 1966.

David E. Price, M.D.
Dr. Price spent his professional career with PHS and had wide experience in its administration.

A native of San Diego, Calif., he was born on July 5, 1914. He received his medical degree at the University of California School of Medicine at Berkeley in 1940 and served his internship at the PHS hospital in San Francisco. He received his doctorate in public health at Johns Hopkins University School of Hygiene and Public Health in 1946.

After a tour of duty with Venereal Diseases Division of the service, Dr. Price was assigned first to DRG as assistant to the chief (1946–47) and then to the National Cancer Institute as chief of the Research Grants Branch (1947–48). In 1948 he returned to DRG as chief, which post he held until the end of 1950 when he was appointed NIH Associate Director for Extramural Affairs. After a series of key appointments in the Public Health Service, Dr. Price was appointed Deputy Director of NIH in 1960 and Deputy Surgeon General of PHS in July 1962. He retired from the service in 1965.

He was executive director of the medical planning and development committee, Johns Hopkins Medical Institution, Baltimore, Md. He retired from Johns Hopkins on July 1, 1980.

Ernest M. Allen, Sc. D.
Dr. Allen came to NIH in January 1946 from the Venereal Diseases Division of PHS where he had been senior public health representative since 1943. His first NIH appointment was assistant chief of the Research Grants Office, which later became the Division. In 1951 he was appointed Division chief.

Born in Terrell, Tex., on December 1, 1904, he received his B.A. magna cum laude from Emory University in 1926, his M.A. in 1939, and an honorary doctor of science degree in 1956.

In November 1953 Dr. Allen accepted the Lasker Award of the American Public Health Association for DRG. He was awarded an honorary degree of doctor of laws by Clemson University in 1968, and received the DHEW Distinguished Service Award in 1971. Other honors include Phi Beta Kappa, Phi Sigma Iota, Phi Theta Kappa, Alpha Epsilon Upsilon, and the Yorktown Medal of the French Government.

He left DRG in 1960 to become NIH Associate Director for Research Grants. From 1969 to February 1973, he was Deputy Assistant Secretary for Grants Administration Policy, DHEW. He was associate director for extramural programs, National Library of Medicine, until his retirement in November 1981.

Dale R. Lindsay, Ph. D.
Dr. Lindsay became a PHS career officer in 1943 and was assigned to malaria control in the War Areas Program.

A native of Bunker Hill, Kans., he was born August 9, 1913. He received the Ph. D. degree in entomology at Iowa State College where he was a research associate and instructor from 1938 to 1943.

In 1948 Dr. Lindsay was appointed chief of the service's field station in Thomasville, Ga. Then in 1953, he became chief of the Program Analysis Section of the Division of Research Grants, NIH. Two years later he was named scientific director of DRG and served successively as assistant chief and chief of the Division until his retirement from PHS in 1963.

Eugene A. Confrey, Ph. D.
Dr. Confrey came to DRG in November 1962 as assistant chief from the Bureau of State Services where he had been assistant to the chief of the Office of Research Grants for Community Health. Before that he served in the Office of the Surgeon General, PHS.

A native of Buffalo, N.Y., he was born on April 6, 1922. He received his Ph. D. degree from Yale University in 1963. He was appointed chief of DRG in October 1963. His title was changed to Director in 1966. He left DRG in 1969 to become associate director for program planning and evaluation, BEMT.

In 1972, Dr. Confrey was appointed associate director for policy studies, BHME, a post he held until his retirement in June 1973.

Stephen P. Hatchett, Ph. D.
Dr. Hatchett came to NIH in 1955 as assistant chief, Research Fellowships Review Branch, DRG. Previously, he had been professor and head of the biology department at Presbyterian College, Clinton, S.C., and at American University, Washington, D.C., where he was also chairman of the division of natural sciences.

He was appointed chief, Research Fellowships Review Branch (later Career Development Review Branch) in 1958; deputy director of the Division in 1964; and Director in 1969.

A native of Mogollon, N. Mex., Dr. Hatchett was born on June 30, 1915. He received his B.A. degree from American University in 1937, and his M.A. (1938) and Ph. D. (1943) degrees from the University of Michigan, Ann Arbor.

In 1963, he received the DHEW Superior Service Award. Dr. Hatchett died August 22, 1976.

Carl D. Douglass, Ph. D.
Dr. Douglass came to DRG as associate director for statistics, analysis, and research evaluation in 1970. He became deputy director of the Division in 1972, was named Acting Director in August 1976 and appointed Director in April 1977.

A native of Little Rock, Ark., he was born on April 27, 1925. He received his B.S. degree from Hendrix College, Conway, Ark., in 1947, and M.S. (1949) and Ph. D. (1952) degrees in chemistry from the University of Oklahoma. He was a fellow at the Oak Ridge Institute for Nuclear Studies from 1951 to 1952. He joined the University of Arkansas in the department of biochemistry and progressed to associate professor of biochemistry. In 1959 he was appointed chief of the Nutrition Branch, Food and Drug Administration.

Dr. Douglass joined NIH in 1961 and was appointed nutrition program officer, NIAMD. After 1964, he held a series of key appointments in the National Library of Medicine. In 1967 he was appointed associate director for program development, DRFR (later DRR), and 3 years later was named associate director of that Division.

In 1961 he received a Unit Citation for Superior Performance from FDA, in 1973 the DHEW Superior Service Award and in 1980 and 1982 Senior Executive Performance Awards. He is a member of the American Chemical Society, the Society for Experimental Biology and Medicine, the American Institute of Nutrition, and the American Institute of Biological Sciences.

Division of Research Resources

Mission

Strengthens and enhances programs of institutions engaged in health-related research by developing and supporting a wide variety of essential resources.

Develops and supports biotechnology resources providing access to the latest technologies from the physical sciences, mathematics, and engineering; general clinical research centers specializing in clinical research within hospitals; and animal resource projects that involve more effective use of animals in research. In addition, funds the seven national Primate Research Centers and a number of unusually valuable animal colonies.

Awards minority biomedical research support grants to increase the participation of ethnic minority students and faculty in the biomedical sciences and health professions; and funds biomedical research support grants that enable institutions to more efficiently and effectively conduct biomedical research through the use of local decisionmaking.

Important Events in DRR History

April 13, 1962—Announcement of the new Division of Research Resources Facilities and Resources was made by Dr. Luther L. Terry, PHS Surgeon General.

July 12, 1962—A memorandum establishing DRFR and outlining its functions and responsibilities was issued by Dr. James A. Shannon, NIH Director.

July 15, 1962—DRFR was established.

January 4, 1969—Notice in the *Federal Register* renamed DRFR as the Division of Research Resources, placing it within the Bureau of Health Professions Education and Manpower Training, and moving the Health Research Facilities Branch to the Division of Educational and Research Facilities also within the Bureau.

September 18, 1970—The Division of Research Resources was

separated from BHME, and became a separate Division within NIH.

October 29, 1975—The NIH Director approved the revised mission of the Division and an internal organization.

DRR Legislative Chronology

July 30, 1956—The Health Research Facilities Act of 1956 (Title VII of the PHS act) authorized a PHS program of Federal matching grants to public and nonprofit institutions for health research facilities construction.

August 27, 1958—Public Law 85-777 extended Title VII for an additional 3-year period.

August 19, 1959—Congress appropriated $2 million for the establishment of one or two primate research centers.

September 15, 1960—Public Law 86-798 amended the Public Health Service Act to authorize grants-in-aid to universities, hospitals, laboratories, and other public and nonprofit institutions to strengthen their programs of research and research training in sciences related to health. The act also authorized the use of funds appropriated for research or research training to be set aside by the Surgeon General in a special account for general research support grants.

October 5, 1961—Public Law 87-395 extended Title VII for 1 year, included research training areas, and increased the authorization to $50 million.

October 17, 1962—Public Law 87-838, extended Title VII for an additional 3-year period at an annual funding level of $50 million.

September 24, 1963—Public Law 88-129 amended the Health Research Facilities Act of 1956 to allow grants for multipurpose facilities that would provide teaching space as well as essential research space.

October 31, 1963—Public Law 88-164, known as the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963, authorized a total of $329 million over a 5-year period for matching grants to assist in the construction of mental retardation research centers and community mental health centers, and to train teachers of mentally retarded and other handicapped children.

August 9, 1965—Public Law 89-115 extended Title VII Part A for an additional 3-year period and authorized an aggregate appropriation of $280 million for FY 1967, 1968, and 1969.

August 16, 1968—Public Law 90-490, the Health Manpower Act of 1968, extended Title VII Part A for an additional 2-year period and authorized $20 million for FY 1970 and $30 million for FY 1971.

Biographical Sketches of DRR Directors

Frederick L. Stone, Ph. D.
A native of Biloxi, Miss., Dr. Stone received his B.S. degree from Middlebury College, Vt., in 1937. From the University of Rochester in New York he received his M.S. degree in 1942 and his Ph. D. in 1946. After service in the U.S. Marine Corps, he was commissioned in the regular corps, PHS, and was stationed at NIH until 1954, serving as assistant chief of DRG and special assistant to the Associate Director of NIH.

After a short absence during which he was director of the medical and scientific department of the National Multiple Sclerosis Society and assistant vice chancellor for professional services in the Schools of the Health Professions at the University of Pittsburgh, he returned to NIH. From 1958 to 1962, he was assistant chief of what was then the Division of General Medical Sciences and was chief of its Research Training Branch.

On July 15, 1962, Dr. Stone was appointed chief of the new Division of Research Facilities and Resources. He was appointed Director of the National Institute of General Medical Sciences on August 1, 1964, and at that time became acting chief of DRFR, holding the latter position until June 30, 1965.

Thomas J. Kennedy, Jr., M.D.
A native of Washington, D.C., Dr. Kennedy received his B.S. degree in 1940 from Catholic University in the District of Columbia, and his M.D. in 1943 from Johns Hopkins University, Baltimore, Md. During World War II he was assigned to the U.S. Army's Office of Scientific Research and Development. Following his military service he was appointed, in 1947, to the staff of Goldwater Memorial Hospital, New York City, and was a research fellow there from 1949 to 1950.

Dr. Kennedy was commissioned in PHS and joined the staff of the National Heart Institute in 1950. He was engaged in research in renal and electrolyte physiology in NHI's Laboratory of Kidney and Electrolyte Metabolism until 1960, when he was designated assistant to the Director of Laboratories and Clinics, NIH.

In 1962, he was appointed special assistant to the Director for Scientific Communications, NIH. On July 1, 1965, he was named chief of DRFR. His title was changed to Director in 1966.

Dr. Kennedy later became Associate Director for Program Planning and Evaluation in the Office of the Director, NIH.

He accepted a position with the National Academy of Sciences as executive director of the Assembly of Life Science, National Research

Council, after retiring from Federal service in August 1974.

On July 1, 1976, Dr. Kennedy joined the Association of American Medical Colleges as director of the division of planning and policy development.

Thomas G. Bowery, Ph. D.
Born in Avalon, Pa., Dr. Bowery received his B.S. degree from Michigan State University, his M.S., and his Ph. D. in 1951 from Rutgers University.

From 1951 to 1952, Dr. Bowery was research assistant professor at the University of Florida, where he developed a research laboratory for the study of pesticide residue problems.

In 1953, he joined the staff of North Carolina State University in Raleigh as research professor in the department of chemistry and as director of the Pesticide Residue Laboratories. In the latter position, he coordinated and directed programs in pesticide residue research for the North Carolina Agricultural Experiment Station.

Dr. Bowery was named to the first class of NIH grants associates in 1962, and the following year was appointed special assistant to the Associate Director for Research Grants, Office of the Director, NIH.

Prior to joining DRFR as assistant chief in November 1965, he was extramural operations and procedures officer, Office of the Director, NIH, for 18 months.

On September 3, 1968, Dr. Bowery was named Acting Director of DRFR which became the Division of Research Resources. He was named Director on November 30, 1969.

He was given an NIH Equal Employment Opportunity Special Achievement Award in 1975 and 2 years later he received a PHS Superior Service Award.

Dr. Bowery stepped down as DRR Director on January 15, 1981, to become director of the Biomedical Research Support Program.

James F. O'Donnell, Ph. D. (Acting)
Born in Cleveland, Ohio, Dr. O'Donnell received his B.S. degree in biology from St. Louis University in 1949 and a Ph. D. in biochemistry from the University of Chicago in 1957.

From 1957 to 1968, he was assistant, then associate, professor in biological chemistry and experimental medicine at the University of Cincinnati College of Medicine. He began his Federal service in 1968 as a grants associate in the Division of Research Grants. A year later, he became a health scientist administrator for the Population and Reproduction Grants Branch, Center for Population Research, National Institute of Child Health and Human Development. From 1969 to 1971, he was program director for that branch.

In 1977, Dr. O'Donnell was named DRR assistant director, deputy director in 1976, and Acting Director In January 1981. He is currently deputy director.

Among his honors and awards, Dr. O'Donnell was presented an NIH Director's Award for Performance in June 1979. During his career at NIH he also has received Senior Executive Service Performance Awards in 1982 and 1984. His memberships include the New York Academy of Sciences and the Society of Research Administrators.

Betty H. Pickett, Ph. D.
Born in Providence, R.I., Dr. Pickett attended Brown University in Providence, earning an A.B. degree in 1945, a Sc.M. in 1947, and a Ph. D. in psychology in 1949.

From 1949 to 1951, she was assistant professor of psychology at the University of Minnesota, Duluth, followed by brief appointments as assistant professor of psychology at the University of Nebraska, and lecturer in psychology at the University of Connecticut. From 1953 to 1958, she served as professional associate in psychological sciences at the Bio-Sciences Information Exchange of the Smithsonian Institution, Washington, D.C.

Dr. Pickett began her career at NIH in 1958 as executive secretary of the Behavioral Sciences Study Section and, subsequently, the Experimental Psychology Study Section in the Division of Research Grants, prior to her appointment as chief, cognition and learning section of the Behavioral Sciences Research Branch of the Division of Extramural Research Programs, NIMH. She later served as deputy director of that division from 1968 until 1974, when she became director of the Division of Special Mental Health Programs. In 1974 she was awarded the DHEW Superior Service Award and in 1975 the DHEW Distinguished Service Award. During her career at NIH, she has received Senior Executive Service Performance Awards in 1981, 1982, and 1984.

After serving as acting director of the Division of Extramural Research Programs, NIMH, she moved to the National Institute on Aging in 1977 as associate director for extramural and collaborative research programs. In 1979, she was appointed deputy director of the National Institute of Child Health and Human Development, where she also served as Acting Director from July 1, 1981 to July 1, 1982.

Dr. Pickett was named DRR Director on October 1, 1982.

Major Programs

General Clinical Research Centers
The Division's general clinical research centers offer a special environment for the examination of research patients by medical

DRR Appropriations—Grants and Direct Operations

Fiscal year	Total grants	Direct operations	Total [1]
	[Amounts in thousands of dollars]		
1963	$125,500	$1,207	$126,707
1964	130,600	1,319	131,919
1965	145,884	1,945	147,829
1966	148,850	4,104	152,954
1967	144,768	3,901	148,669
1968	169,416	4,298	173,714
1969	130,501	4,409	134,910
1970	129,009	3,703	132,712
1971	123,988	2,913	126,901
1972	132,286	3,362	135,648
1973	131,625	4,142	135,767
1974	129,334	4,138	133,472
1975	121,331	5,869	127,200
1976	124,307	5,958	130,265
1977	129,303	8,197	137,500
1978	136,297	8,798	145,095
1979	144,437	9,727	154,164
1980	159,702	9,494	169,196
1981	167,170	8,457	175,627
1982	175,505	8,672	184,177
1983	204,638	9,279	213,917
1984	233,270	9,907	243,177

[1] Includes health research facilities construction grants transferred to the Bureau of Health Professions Education and Manpower Training in FY 1969. Appropriations for such construction were terminated by Congress in FY 1970.

scientists in their continuing struggle against human disease and disability. At clinical research centers, investigators take advances from basic medical science and develop them into refined clinical tools to prevent and treat illness. Grants awarded through this program may be used for equipment, special laboratories, diet kitchens, salaries for highly trained staff (including nurses, dietitians, and other professionals), and the hospitalization costs of research patients.

Primate Research Centers
The primate research centers provide support for seven unique centers that conduct biomedical and behavioral research using primates as the experimental animal. Initial awards were made for construction of physical facilities at all seven centers. Operating awards are made each year following detailed review of each proposed center budget by NIH staff. The overall core program of each center also receives regular NIH peer review. Universities serve as host institutions for the primate research centers and provide academic environments of high standard for the staff and visiting scientists.

Areas of research emphasis include reproductive biology, infectious diseases, neurosciences, behavioral research, metabolic and nutritional diseases, cardiovascular diseases, and environmental health and toxicology. Based on the availability of facilities, the centers maintain extensive collaborative programs for scientists from many institutions. Visiting scientist programs for investigators from the United States and abroad are also included within the centers.

Laboratory Animal Sciences
The laboratory animal sciences program is designed to increase and improve laboratory animal facilities and resources through grants which support: development and maintenance of colonies of special research animals; definition of specific animal models for research; development and improvement of institutional animal resources; postdoctoral training programs in laboratory animal medicine and science; research to improve the health and well-being of research animals; projects for developing and maintaining diagnostic laboratories for the diseases of research animals; and projects for gathering and disseminating information on research animals.

Biomedical Research Technology Resources
A biomedical research technology resource combines expensive equipment, complex methodologies, and scarce expertise to facilitate the solution of important biomedical research problems. It serves research investigators within a university, research institution, region, or the entire Nation. Biomedical research technology resource centers take many forms such as biomedical computer centers, biomedical engineering centers, and instrumentation centers for study of biomolecular and cellular structure and function.

This award supports the establishment, staffing, and maintenance of special equipment or services, laboratories, centers, etc., of a complexity or cost that single investigators could not be expected to support. Thus the establishment of the resource adds a new dimension in special expertise and capability to the research potential of qualified investigators. Particular emphasis is placed on those shared resources operating on a regional or national basis.

Biomedical Research Support
Biomedical research support grants provide funds on a formula basis to eligible health professional schools, other academic institutions, non-Federal hospitals, state and municipal health agencies, and nonprofit organizations engaged in biomedical research.

The program is specifically designed to complement other forms of biomedical research support. The objective is to strengthen and enhance the research environment of institutions heavily engaged in health-related research. A distinguishing feature of the program is that decisions about specific uses of funds are made by grantee institutions. Primary uses of grant funds are for pilot research, support of young investigators, central shared equipment and facilities, unanticipated necessities and emergencies, research opportunities for minorities and women, improvement in research skills of investigators, any low cost outlay that would not justify formal application for national review, and urgent research needs

that require prompt support to avoid costly delays.

In 1982, the Shared Instrumentation Grant Program was initiated within the Biomedical Research Support Program. This mechanism provides for the purchase of badly needed, expensive, state-of-the-art research instruments such as electron microscopes and magnetic resonance spectrometers, to be used on a shared basis at academic and research institutions.

Minority Biomedical Support

The Minority Biomedical Research Support Program addresses the problem of underrepresentation of ethnic minorities in biomedical sciences by strengthening institutional research capabilities and by increasing faculty and student research participation at minority and other eligible institutions.

MBRS provides program funds for release time to give faculty members an opportunity to conduct biomedically oriented research. Equipment, supplies and necessary renovations for approved research projects are supported by this program. Funds are also provided for student participation in research. Consortia, collaborative arrangements, special summer projects, and travel to scientific meetings are other activities supported.

A supplemental grant program for instrumentation was initiated in 1983 to provide much needed state-of-the-art research equipment for MBRS investigators conducting biomedical research.

Two additional grant programs were initiated in 1985. One is designed to increase biomedical research participation by faculty and students at eligible undergraduate colleges not currently participating in the MBRS program; the other encourages collaborative research among faculty at developing minority institutions that grant doctoral degrees.

Division of Research Services

Mission

Provides the following centralized services to NIH:

- Biomedical engineering and instrumentation services;
- Medical library and translating services;
- Medical illustration, design graphics and photographic services;
- Provision of research animals, facilities for their care and use, and disease control services.

Important Events in DRS History

1956—DRS was established on January 1. Until 1955 most of the basic functions now vested in DRS were performed by several branches of the Office of the Director, NIH. DRS was established to provide equipment and a wide variety of professional and technical services essential to the needs of NIH medical investigators and research administrators.

1960—NIH acquired 513 acres of farmland near Poolesville, Md., on May 6. This land became the site of the NIH Animal Center.
In response to NIH's growing need to apply computer technology to its biomedical research programs, the former Biometrics Branch was abolished and the Statistical Processing Section was reorganized as the Computation and Data Processing Branch.

Increasing demand by NIH investigators for highly sophisticated instruments prompted establishment of an Instrument Engineering and Development Branch, taking over, on an enlarged scale, the instrumentation function originally vested in the Laboratory Aids Branch.

The Editorial Section and Publications and Reports Section were transferred to the Office of Research Information; the Library Section was reorganized as the Library Branch within DRS; and the remaining Medical Arts Section and Photographic Section of the Scientific Reports Branch were reorganized as the Medical Arts and Photography Branch. Concurrent with these changes, the Scientific Reports Branch was abolished.

1965—The Computation and Data Processing Branch was transferred to the new Division of Computer Research and Technology.
To reflect its increasingly broad engineering support activities, the Instrument Engineering and Development Branch was renamed the Biomedical Engineering and Instrumentation Branch.

1968—To increase effectiveness of its engineering services, DRS reorganized and created two new branches (Engineering Design and Construction Engineering) and they realigned the Plant Engineering Branch. The Research Facilities Planning Branch was abolished. The NIH Library moved to its new quarters in the Clinical Center.

1969—The Engineering Design, Construction Engineering, and Plant Engineering Branches were transferred as a group to form a new Office of Engineering Services under the Associate Director for Administration, OD, NIH, effective June 1. The redefinition of its mission enabled DRS to give increased direction to its collaborative support functions of NIH laboratory research programs.

1972—The Laboratory Aids Branch was renamed the

Veterinary Resources Branch—more accurately describing its primary function.

1974—The Veterinary Resources Branch was designated by the World Health Organization as a Collaborating Center for Defined Laboratory Animals. As such it serves as an international genetic resource for strains of laboratory animals.

The International Council for Laboratory Animal Science designated the Small Animal Section, VRB, as an international nude mouse reference center.

Well-defined open formula diets for mice and rats were developed and put into use, thereby enabling investigators to eliminate nutritional status as an experimental variable.

The Interagency Primate Steering Committee was established by the Assistant Secretary for Health, DHEW, with the National Institutes of Health as the lead agency. DRS was assigned the responsibility for the administrative support of this activity. This action was taken in response to the shortages of a number of primate species vital to biomedical research activities. The committee was given the responsibility for planning and developing a national primate program to assure an adequate supply of primates for health activities in the United States.

A primate breeding center for domestic production of nonhuman primates for NIH intramural research was established at Perrine, Fla.

The Radiation Safety Section of the Clinical Center and the Safety Office of the NIH Office of Administrative Services were transferred to the Division of Research Services. Consolidation of environmental health and safety programs occurred under an associate director for environmental health and safety, DRS.

1977—A Genetics Unit was established to monitor the genetic integrity of mice and rats maintained in the branch. It is anticipated that monitoring will be extended to include other species as these are more fully defined. A primate recycle program was established to help assure an adequate supply of research primates and to obtain maximum utilization of primate resources.

1979—The Environmental Health and Safety Program was moved from DRS and combined with elements from other Institutes to form a new NIH Division of Safety.

1980—A reproductive services laboratory was established to develop and apply gamete and embryo cryopreservation techniques to preserve animal models for future research programs.

1983—The Interagency Primate Steering Committee, established in 1974, was renamed by the Assistant Secretary for Health as the Interagency Research Animal Committee. Its scope was broadened to serve as focal point for Federal agencies' discussions of issues involving all animal species needed for biomedical research and testing. Principal concerns are the conservation, use, care, and welfare of research animals. The number of agencies taking part was increased accordingly. NIH remains the lead agency, with DRS providing administrative support.

1983—On December 30, NIH promulgated Manual Issuance 3040-2: Animal Care and Use in the Intramural Program. One provision required the Veterinary Resources Branch, DRS, to furnish the executive secretary and staff support for the NIH Animal Research Committee. The Interagency Research Animal Committee staff undertook these responsibilities, including various projects to help Institute intramural programs fulfill the requirements of the issuance.

DRS Legislative Chronology

January 1, 1956—The Surgeon General approved the establishement of DRS under the authority of section 301 of the Public Health Service Act as amended (42 U.S.C. 241).

Biographical Sketches of DRS Directors

Chris A. Hansen, M.S.
Mr. Hansen became the first chief of DRS in April 1956. His title was changed to Director in 1966. Before coming to NIH he was assistant chief (operations) of the Communicable Disease Center, Atlanta, Ga.

He joined the PHS in 1942 and was assigned to the Headquarters of Malaria Control in War Areas in Atlanta. He remained with this organization (which became the CDC in 1946) until he joined NIH.

Born September 17, 1915, in Guelph, N. Dak., Mr. Hansen graduated from North Dakota State College in 1937 with a B.S. in civil engineering and was awarded his M.S. in sanitary engineering by the University of North Carolina in 1942.

In July 1968, he was named to the post of commissioner of the new Environmental Control Administration.

William B. DeWitt, Ph. D.
Dr. DeWitt was appointed Director in June 1969. Previously he served as DRS Acting Director (July 1968–June 1969) and as the Division's scientific director and associate director for laboratory resources (1965–1968).

Born in Birmingham, Ala., on June 3, 1921, Dr. DeWitt was an alumnus of Howard College, Birmingham. He received his M.A. degree in 1952 and his Ph. D. in

1956 in parasitology, both from George Washington University.

During World War II, he served in the U.S. Navy. He later joined the NIH staff in 1949 as a medical parasitologist in the Laboratory of Tropical Diseases, National Microbiological Institute (which became NIAID in 1955), and in 1951 he became a PHS commissioned officer with the Laboratory of Parasitic Diseases.

Dr. DeWitt was serving as DRS Director at the time of his death on August 8, 1971.

Roger D. Estep, D.V.M.
Dr. Estep, named Director of the Division of Research Services in November 1971, was born in Clarksville, Md.

He received his B.S. degree from Maryland State College in 1951 and his M.S. from Pennsylvania State University in 1957. He earned his D.V.M. in 1962 from Tuskegee Institute.

Dr. Estep resigned his post in July 1972 to become vice-president for development and university relations at Howard University.

Joe R. Held, D.V.M.
Dr. Held was named Director of DRS in July 1972. Previously he served DRS as chief, Veterinary Resources Branch (November 1969 to July 1972) and as Acting Director (August 1971 to December 1971).

Born in Los Angeles, Calif., in 1931, he received his B.S. and D.V.M. degrees from the University of California at Davis and his M.P.H. degree from Tulane University.

Dr. Held joined the PHS Commissioned Corps in 1955 and was assigned to the Communicable Disease Center, Atlanta, Ga. In 1962 he transferred to the NIH Division of Research Facilities and Resources, and in 1964 to the National Institute of Allergy and Infectious Diseases. From 1967 to 1969 he was detailed to the Pan American Zoonoses Center in Buenos Aires, Argentina.

In 1975 he was named the PHS chief veterinary officer and was promoted to the rank of Assistant Surgeon General.

Dr. Held resigned his post in November 1984 to become director of the Pan American Zoonoses Center in Buenos Aires, Argentina.

Robert A. Whitney, Jr., D.V.M., Acting
Dr. Whitney was named acting DRS Director in November 1984. He had served previously as chief, Veterinary Resources Branch, since 1972.

At the same time, he was also named PHS chief veterinary officer and chairman of the Interagency Research Animal Committee.

Born July 27, 1935, in Oklahoma City, Okla., Dr. Whitney received his D.V.M. from Oklahoma State University in 1959 and his M.S. in pharmacology from Ohio State University in 1965.

He served as a veterinary officer in the U.S. Army from 1959 to 1971, when he transferred to the PHS commissioned corps. He was director of the Army Veterinary Corps' postdoctoral training in laboratory animal medicine and a consultant to the Army Surgeon General for laboratory animal medicine.

In the commissioned corps, Dr. Whitney served briefly as a special projects officer in the Animal Resources Branch, DRR, before becoming chief of the Veterinary Resources Branch.

National Library of Medicine

Mission

The National Library of Medicine, one of three national libraries, is the world's largest research library in a single scientific and professional field. The Library has a statutory mandate from Congress to apply its resources broadly to the advancement of medical and health-related sciences. It collects, organizes, and makes available biomedical information to investigators, educators, and practitioners, and carries out programs designed to strengthen existing and develop new medical library services in the United States. It is the central resource for the existing national biomedical information system.

Important Events in NLM History

1836—The Library of the Office of the Surgeon General of the Army was established (the present NLM).

1865—John Shaw Billings, M.D., was assigned to supervise the Surgeon General's Library, which he developed into a national resource of biomedical literature.

1880—The first volume of *Index Catalogue* was published. By 1961, when it was discontinued after 61 volumes, this publication had listed 3,674,111 citations to medical books and articles, making it preeminent among scientific bibliographies of the world.

January 1922—The Library of the Office of the Surgeon General (Army) was renamed Army Medical Library.

April 1952—The Army Medical Library was renamed the Armed Forces Medical Library.

October 1, 1956—The Armed Forces Medical Library was designated the National Library of Medicine and placed under the Public Health Service.

December 1961—The new building at 8600 Rockville Pike was dedicated.

January 1964—The Medical Literature Analysis and Retrieval System (MEDLARS®) became operational at NLM.

January 1, 1967—A Toxicology Information Program was established at NLM in response to recommendations of the President's Science Advisory Committee.

July 1, 1967—The Public Health Service Audiovisual Facility, renamed the National Medical Audiovisual Center (NMAC), became a component of the National Library of Medicine.

April 1, 1968—The National Library of Medicine became a component of NIH.

October 1971—MEDLINE (MEDLARS Online) is initiated to provide online access to a major portion of the MEDLARS data base.

September 1972—TOXLINE®, an online bibliographic service covering the areas of pharmacology and toxicology, became operational.

November 1974—MEDLARS accessioned its two millionth citation.

May 22, 1980—NLM's Lister Hill National Center for Biomedical Communications (LHNCBC) building was dedicated. The new building, adjacent to the Library, houses NLM's research and development component (LHNCBC), as well as its grants, toxicology, and audiovisual programs. One floor of the building is occupied by NIH's Fogarty International Center.

Janary 1983—The research and development programs of the Lister Hill Center and the audiovisual programs of the National Medical Audiovisual Center are combined into one organization—the Lister Hill National Center for Biomedical Communications.

October 11, 1984—Dr. Donald A.B. Lindberg, was sworn in as NLM Director.

NLM Legislative Chronology

August 3, 1956—An amendment to Title III of the Public Health Service Act, The National Library of Medicine Act, placed the Armed Forces Medical Library under the Public Health Service, and renamed it the National Library of Medicine (P.L. 84–941).

October 22, 1965—The Medical Library Assistance Act of 1965 (P.L. 89–291) was signed into law, authorizing NLM's extramural programs of grant assistance to help expand and improve the Nation's medical library and health communications resources, technology, and manpower for service to the health community.

August 3, 1968—Public Law 90–456 authorized the designation of the Lister Hill National Center for Biomedical Communications.

NLM Appropriations—Grants and Direct Operations

Fiscal year	Total MLA *	Direct operations	Total
	[Amounts in thousands of dollars]		
1956		$1,215	[1] $1,215
1957		1,314	[1] 1,314
1958		1,450	1,450
1959		1,526	1,526
1960		1,566	1,566
1961		1,738	1,738
1962		2,066	2,066
1963	—- $6	3,329	3,335
1964		4,074	4,074
1965	120	3,838	3,958
1966	4,030	5,655	9,685
1967	12,755	7,437	20,192
1968	10,550	11,124	[2] 21,674
1969	5,788	12,372	18,160
1970	6,157	13,525	19,682
1971	5,992	15,448	21,440
1972	6,892	17,235	24,127
1973	6,622	18,528	25,150
1974	7,029	19,300	26,329
1975	6,682	22,168	28,850
1976	6,433	22,632	29,065
1977	8,000	27,234	35,234
1978	7,987	29,632	37,619
1979	8,987	32,444	41,431
1980	9,925	34,054	43,979
1981	9,830	34,836	44,666
1982	7,500	37,535	45,035
1983	13,400	38,543	51,943
1984	7,573	42,040	49,613

*Medical Library assistance (extramural programs).
[1] Estimated cost; first included in Public Health Service budget in 1958.
[2] Includes $1,762,000 transferred from Communicable Disease Center for National Medical Audiovisual Center.

Biographical Sketch of NLM Director

Donald A.B. Lindberg, M.D.
Dr. Lindberg assumed the directorship of NLM in August 1984. Born September 21, 1933, in Brooklyn, N.Y., he received his A.B. degree (*magna cum laude*) from Amherst College and his M.D. degree from the College of Physicians and Surgeons of Columbia University. He received his specialty training in anatomic and clinical pathology at Columbia-Presbyterian Medical Center in New York. He also holds the D.Sc. from Amherst College, *honoris causa.*

Following early research in experimental pathology, he later began a long-term investigation of the use of computers in medicine, founding in 1963 one of the Nation's first medical computer centers at the University of Missouri. His most recent research has been in applying artificial intelligence techniques to the development of expert consulting systems.

Prior to joining the Library, Dr. Lindberg was director of the Information Science Group and professor of pathology at the University of Missouri School of Medicine in Columbia. He taught pathology at Missouri from 1962 until his present appointment. He also served as chairman of the department of information science at the university's School of Library and Information Science.

Dr. Lindberg has published extensively in the fields of pathology and medical information. He is the author of two books—*The Computer and Medical Care* (1968) and *The Growth of Medical Information Systems in the United States.*

Major Programs

MEDLARS

The Library's computer-based MEDLARS was established in January 1964 to achieve rapid bibliographic access to NLM's vast store of biomedical information. The principal objective of MEDLARS is to provide references to the biomedical literature for researchers, clinicians, and other health professionals. This is accomplished through:

1) preparation of citations for publication in *Index Medicus,* a comprehensive, subject-author index to articles from approximately 2,700 of the world's biomedical journals, and the *NLM Current Catalog,* a bibliographic listing of citations to publications cataloged by the Library;

2) compilation of other recurring bibliographies on specialized subjects of wide interest;

3) publication and distribution of selected searches (designated "Literature Searches") on a wide basis; and

4) provision of online search services through MEDLINE, TOXLINE, and other data bases.

Agreements with foreign institutions provide MEDLARS services to an international community of health scientists.

Online Data Bases

In 1971 NLM initiated its MEDLINE service to provide an online bibliographic searching capability through terminals in libraries at medical schools, hospitals, and research institutions throughout the country. By typing simple instructions on a terminal connected by communications networks to the central computer, a physician or other health professional can retrieve almost instantaneously references to the most current indexed journal articles in his area of interest. In addition to MEDLINE, other online data bases deal with toxicology information, cataloging information, audiovisual materials, history of medicine, cancer literature, hospital and health care literature, medical ethics, and reproductive biology. Over 2,500 institutions in the U.S. now have access to these data bases.

Regional Medical Library Services

To provide more efficient dissemination of biomedical information, NLM has been developing a network arrangement through which MEDLARS and interlibrary loan services can be shared efficiently by medical libraries. The network consists of seven Regional Medical Libraries. Although NLM remains the heart of the network, more and more services are being provided directly by regional libraries.

Lister Hill National Center for Biomedical Communications

The Lister Hill center, the research and development arm of NLM, is named after the former senator from Alabama. The Center explores the use of computer, communication, and audiovisual technologies to improve the organization, dissemination, and utilization of biomedical information.

The Center played a lead role in developing the MEDLARS online retrieval system in the late sixties and since then has conducted a number of valuable experiments using NASA satellites, microwave and cable television, and computer-assisted instruction. Currently the Center is investigating the potential of optical videodisc technology for document preservation, storage, and retrieval, and also has under way several projects that combine videodisc technology with microcomputers to develop innovative health-science teaching materials.

Toxicology Information Program

This program, established at NLM in 1967, fulfills recommendations made by the President's Science Advisory Committee in recognition of the impact of chemical contaminants on the environment and their effects on human health and welfare. The general objectives of the program are to create computer-based toxicology data banks from scientific literature and from files of collaborating industrial, academic, and governmental agencies, and to establish toxicology information services for scientists.

Toxicology information services are presently being implemented in three ways: 1) query response—a Toxicology Information Response Center has been established at the Oak Ridge National Laboratory, 2) publications, and 3) online retrieval services—including TOXLINE (citations and abstracts) and CHEMLINE (an online chemical dictionary). The program also has a number of collaborative projects such as the online Toxicology Data Bank and the publication TOX-TIPS (Toxicology Testing-in-Progress).

Grants

The extramural (grant) programs of NLM were originally authorized by the Medical Library Assistance Act of 1965 (P. L. 89–291) to provide better health information services through grant support to the Nation's medical libraries. The act, since extended by Congress, offers assistance for library resources, research in biomedical communications, biomedical publications, and Regional Medical Libraries. Since 1965, the biomedical library network has been strengthened by grants from NLM's extramural programs to more than 1,000 institutions.

Part 3

Appropriations

NIH Appropriations and Amounts Appropriated for Grants and Direct Operations, Fiscal Years 1938–84

[Amounts in thousands of dollars]

	Total grants [1]	Direct operations [2]	Total appropriations [3]
1938	140	324	464
1939	171	293	464
1940	277	430	707
1941	237	474	711
1942	230	470	700
1943	181	1,097	1,278
1944	182	2,373	2,555
1945	142	2,693	2,835
1946	850	2,565	3,415
1947	4,004	4,072	8,076
1948	12,475	16,401	28,876
1949	15,916	21,752	37,668
1950	36,754	15,392	52,146
1951	43,509	16,551	60,060
1952	40,545	17,130	57,675
1953	39,132	19,899	59,031
1954	48,612	22,541	71,153
1955	54,331	26,937	81,268
1956	63,265	35,193	98,458
1957	163,544	49,463	213,007
1958	177,376	63,807	241,183
1959	242,539	81,844	324,383
1960	334,430	95,570	430,000
1961	470,439	106,722	577,161
1962	628,998	137,587	766,585
1963	764,782	166,018	930,800
1964	814,569	159,885	974,454
1965	875,199	183,793	1,058,992
1966	1,026,853	217,553	1,244,406
1967	1,155,337	257,646	1,412,983
1968	925,186	253,738	1,178,924
1969	1,098,402	295,650	1,394,052
1970	1,210,320	313,020	1,523,340
1971	1,262,131	392,322	1,654,453
1972	1,642,819	546,737	2,189,556
1973 [4]	1,939,490	557,203	2,496,693
1974 [5]	1,247,917	603,854	1,851,771
1975	1,386,282	703,615	2,089,897
1976	1,479,817	768,309	2,248,126
1977	1,638,637	838,041	2,476,678
1978	1,842,160	935,126	2,777,286
1979	2,141,582	1,017,444	3,159,026
1980	2,356,062	1,069,623	3,425,685
1981	2,542,780	1,014,876	3,557,656
1982	2,537,281	1,094,696	3,631,977
1983	2,850,613	1,155,856	4,006,469
1984	3,292,761	1,175,787	4,468,548

[1] Includes grants for research, fellowships, training, health research facilities and community mental health centers construction, regional medical programs, State control programs, community demonstration projects, and student loans, scholarships, control programs, etc.

[2] Includes funds for research and development contracts, intramural research, the National Library of Medicine, and funds necessary for administrative and program management of NIH.

[3] Excludes direct construction and special foreign currency program, includes NLM and OD.

[4] Excludes DBS.

[5] Reserve legislated by P.L. 93-192 not reflected. Excludes BHME.

Appropriations by Component, Fiscal Years 1938–84

[Amounts in thousands of dollars]

Fiscal year	GRS–NIH	NCI	NIMH	NHLBI	NIDR	NIADDK	NIAID	NINCDS	HRF	DBS	NICHD
1938	64	400									
1939	64	400									
1940	137	570									
1941	141	570									
1942	135	565									
1943	743	535									
1944	2,025	530									
1945	2,274	561									
1946	2,866	549									
1947	6,255	1,821									
1948	10,126	14,500	4,250								
1949	14,540	14,000	9,128								
1950	12,075	18,900	8,666	10,725	1,780						
1951	14,314	20,086	9,505	14,200	1,955						
1952	15,756	19,657	10,562	10,083	1,618						
1953	16,599	17,887	10,895	12,000	1,650						
1954	4,675	20,237	12,095	15,168	1,740	7,000	5,738	4,500			
1955	4,675	21,737	14,148	16,668	1,990	8,270	6,180	7,600			
1956	5,929	24,978	18,001	18,898	2,176	10,840	7,775	9,861			
1957	12,122	48,432	35,197	33,396	6,026	15,885	13,299	18,650	30,000		
1958	14,026	56,402	39,217	35,936	6,430	20,385	17,400	21,387	30,000		
1959	28,974	75,268	52,419	45,613	7,420	31,215	24,071	29,403	30,000		
1960	45,994	91,257	68,090	62,237	10,019	46,862	34,054	41,487	30,000		
1961	83,900	110,300	95,761	86,900	15,500	61,200	44,000	49,600	30,000		
1962	127,637	142,836	108,876	131,912	17,340	81,831	55,341	70,812	30,000		
1963	159,826	155,742	143,599	147,398	21,199	103,388	66,142	83,506	50,000		
1964	154,223	143,194	176,374	127,423	19,166	107,699	67,117	84,471	56,000	4,787	[1] 34,000
1965	164,759	150,011	[2] 222,932	124,824	20,083	113,050	69,847	87,821	58,000	4,969	42,696
1966 [3]	60,469	163,768	[2] 282,669	141,462	23,677	123,203	77,987	101,153	56,000	6,806	55,024
1967	68,534	175,656	[2] 314,119	164,770	28,308	135,687	90,670	116,296	56,000	7,904	64,922
1968	81,141	183,356	([4])	167,954	30,307	143,954	94,422	128,633	35,000	8,649	68,621
1969	84,810	185,149		166,928	29,984	143,888	96,840	128,934	8,400	8,499	73,126
1970 [6]	76,658	190,486		171,378	30,809	146,619	103,695	107,365	([7])	8,239	77,192
1971 [6]	([8])	233,160		194,925	35,440	137,986	102,368	103,502		9,296	94,760
1972 [6]		[9] 378,794		232,627	43,388	153,337	109,118	116,731		9,294	116,427
1973 [14]		492,205		300,000	46,991	167,316	113,414	130,672		([10])	130,429
1974 [16]		551,191		302,915	45,565	159,447	114,000	125,000			130,254
1975		691,666		324,630	50,033	173,514	119,452	142,498			142,435
1976		761,727		370,013	51,291	179,516	126,852	144,446			136,404
1977		815,000		396,661	55,573	219,600	141,000	155,500			145,543
1978		872,388		447,909	61,728	260,253	162,341	178,438			166,390
1979		936,737		510,134	65,213	302,767	191,328	212,365			197,630
1980 [20]		999,869		527,488	68,303	341,206	215,364	241,966			208,953
1981		989,355		549,643	71,114	369,462	232,077	252,533			220,628
1982		986,617		559,637	71,983	368,191	235,895	265,901			226,309
1983		987,642		624,259	79,292	413,492	279,129	297,064			254,324
1984		1,081,581		704,939	88,674	464,026	319,596	335,883			276,046

[1] Derived by transfers from other NIH appropriations as authorized by Congress.

[2] Includes funds for construction of community mental health centers (1965 = $35,000,000; 1966 = $50,000,000).

[3] Includes supplemental.

[4] Transferred to HSMHA, July 1, 1967.

[5] Transferred to HSMHA, July 1, 1968.

[6] Includes supplemental.

[7] Discontinued as an appropriation July 1, 1969.

[8] GR & S discontinued. Research Resources appropriation established. DCTR portion transferred to Management.

[9] Includes Cancer Conquest Program of $100,000,000.

[10] Transferred to FDA July 1, 1972.

[11] Formerly a part of the Neurology Institute.

[12] Formerly a part of the Management Fund.

[13] Formerly a part of GR & S.

[14] No appropriation bill signed in 1973. Figures are based on the continuing resolution.

[15] Totals exclude direct construction and special foreign currency program.

[16] Reserve legislated by P.L. 93–192 not reflected.

[17] Transferred to Health Resources Administration, July 1, 1973.

[18] GRSG transferred from IRD's to RR.

[19] Formerly a part of NICHD.

[20] No enacted appropriation; authorized under continuing resolution.

Appropriations by Component, Fiscal Years 1938–84—*continued*

[Amounts in thousands of dollars]

NIGMS [13]	RMP	NIA [19]	NIEHS	FIC	BHME	NLM	NEI [11]	OD [12]	RR [8]	Total appropriation [15]
										464
										464
										707
										711
										700
										1,278
										2,555
										2,835
										3,415
										8,076
										28,876
										37,668
										52,146
										60,060
										57,676
										59,031
										71,153
										81,268
										98,458
										213,007
										241,183
										324,383
										430,000
										577,161
										766,585
										930,800
										974,454
										1,058,992
127,188	25,000									1,244,406
145,113	48,004									1,412,983
160,284	58,514		17,289	500						1,178,924
163,514	[5]		17,820	600	267,400	18,160				1,394,052
164,654			18,328	2,954	373,616	19,682	24,342	7,323		1,523,340
160,194			20,151	3,666	432,310	21,440	30,032	8,903	66,320	1,654,453
173,474			26,436	4,307	677,671	24,127	37,132	11,712	74,981	2,189,556
183,171			30,956	4,666	742,628	28,568	38,562	12,042	75,073	2,496,693
176,778			28,879	4,767	([17])	25,871	41,631	12,000	[18] 133,472	1,851,771
187,400			35,171	5,589		28,850	44,133	17,326	127,200	2,089,897
187,312		19,288	37,660	5,705		29,065	50,212	18,370	130,265	2,248,126
205,000		30,000	51,141	7,992		35,234	64,000	16,934	137,500	2,476,678
230,796		37,305	64,241	8,483		37,619	85,400	18,900	145,095	2,777,286
277,628		56,911	78,080	8,989		41,431	105,192	20,457	154,164	3,159,026
312,468		69,988	83,893	8,987		43,979	112,989	21,036	169,196	3,425,685
333,764		75,608	93,491	9,124		44,666	117,983	22,531	175,627	3,557,656
339,862		81,903	106,270	9,204		45,035	127,374	23,618	184,177	3,631,977
369,813		93,996	164,867	10,147		51,943	141,901	24,683	213,917	4,006,469
415,937		115,292	180,597	11,336		49,613	155,131	26,720	243,177	4,468,548

Total NIH Research Project Grants by Foreign Country and International Organization, Fiscal Years 1947–84

[Amounts in thousands of dollars]

Country	No.	Amount
Argentina	252	4,226
Australia	457	27,850
Austria	65	386
Belgium	188	3,425
Brazil	212	2,156
Canada	1,383	48,738
Chile	122	1,345
Colombia	54	881
Congo, Rep. of	4	66
Costa Rica	5	100
Denmark	245	3,570
Ecuador	2	28
El Salvador	14	231
Ethiopia	6	142
Finland	192	3,248
France	379	6,359
Germany, Fed. Rep.	102	1,433
Ghana	1	2
Greece	55	650
Guatemala	3	22
Hong Kong	8	88
Iceland	13	337
India	60	637
Iran	12	103
Ireland	56	520
Israel	896	25,141
Italy	477	5,745
Jamaica	17	168
Japan	868	8,421
Jordan	3	110
Kenya	5	93
Korea	29	276
Lebanon	129	1,650
Liberia	26	732
Malaysia	12	108
Mexico	175	2,722
Netherlands	161	3,095
New Zealand	79	1,014
Nigeria	20	500
Norway	103	1,154
Pakistan	5	41
Panama	3	67
Papua & N. Guinea	3	9
Peru	123	2,876
Philippines	37	287
Poland	4	14
Portugal	16	306
Romania	4	103
Senegal	2	60
Singapore	5	56
South Africa, Rep. of	139	3,653
Spain	54	628
Sweden	707	20,344
Switzerland	136	2,516
Taiwan	41	287
Tanganyika	4	10
Thailand	78	1,356
Turkey	2	24
Uganda	1	6
United Kingdom	865	18,839
Uruguay	57	1,092
Venezuela	38	980
Yugoslavia	50	637
International Organizations:		
European Organization for Research on Treatment of Cancer (EORTC)	15	1,235
Federation Dentaire International [3]	11	143
International Brain Research Org. (IBRO)	9	175
International Professional Meetings—Total [1]	33	677
(IACC)	2	1,030
International Association for Research on Cancer (IARC)	1	354
International Union Against Cancer (IUAC)	40	2,211
Pan American Health Organization (PAHO) [2]	133	6,376
World Federation of Neurology (WFN)	12	871
World Health Organization (WHO)	29	5,686

[1] Meetings held in foreign countries with foreign principal investigators.

[2] Includes grants to the Institute of Nutrition of Central America and Panama.

[3] Adjustment was made to include all Federation Dentaire grants in one category whether they were meetings or regular grants.

Total Number and Amount of Foreign Research Project Grants Awarded by NIH by Fiscal Years, 1947–84

[Amounts in thousands of dollars]

Fiscal year	No.	Amount
1947	5	130
1948	11	253
1949	16	130
1950	20	219
1951	28	210
1952	22	257
1953	24	245
1954	15	145
1955	14	111
1956	18	190
1957	61	824
1958	92	1,307
1959	170	2,997
1960	307	5,249
1961	563	8,999
1962	811	13,410
1963	981	14,956
1964	932	13,759
1965	801	11,467
1966	718	10,010
1967	624	8,509
1968	480	6,424
1969	325	4,481
1970	170	2,968
1971	120	2,489
1972	113	2,449
1973	116	2,905
1974	119	3,360
1975	130	3,917
1976	138	5,128
1977	149	6,532
1978	162	7,514
1979	191	10,042
1980	206	11,139
1981	237	13,223
1982 *	212	13,336
1983 *	214	14,079
1984	191	15,708

* Includes Cooperative Agreement Awards.

Part 4
The Staff

Number and Types of Personnel at the Hygienic Laboratory

Year	Commissioned	Professors	Other scientific and technicians	Non-scientific	Total
1909	9	3	13	28	53
1910	11	2	12	28	53
1911	13	3	12	27	55
1912	12	3	12	29	56
1913	17	3	11	32	63
1914	22	3	11	35	71
1915	14	3	13	34	64
1916	13	3	22	31	69
1917	16	3	23	36	78
1918	13	3	39	37	92
1919	13	3	38	42	96
1920	13	3	37	50	103
1921	10	3	39	75	127
1922	17	3	45	65	130
1923	10	3	52	56	121
1924	11	3	51	48	113
1925	14	3	49	50	116
1926	13	3	47	51	114
1927	15	3	43	53	114
1928	13	3	45	57	118
1929	12	3	51	62	128

Source: Victor H. Kramer, *The National Institute of Health: A Study in Public Administration* (New Haven, Conn.: Quinnipiack Press, Inc., 1937), p. 82.

Employment (1930–84)

Year	Number of employees	Year	Number of employees
1930	140	1958	7,145
1931	150	1959	8,484
1932	165	1960	9,109
1933	139	1961	10,175
1934	160	1962	11,037
1935	159	1963	11,511
1936	183	1964	11,822
1937	695	1965	12,194
1938	912	1966	12,643
1939	1,048	1967	11,730
1940	1,137	1968	13,105
1941	1,367	1969	13,350
1942	1,456	1970	13,243
1943	1,352	1971	14,002
1944	1,144	1972	13,789
1945	1,090	1973	12,931
1946	1,436	1974	13,318
1947	1,505	1975	13,897
1948	2,245	1976	14,495
1949	2,937	1977	14,658
1950	2,888	1978	14,610
1951	3,012	1979	14,439
1952	3,277	1980	14,634
1953	3,888	1981	14,984
1954	4,621	1982	14,869
1955	5,412	1983	15,449
1956	6,334	1984	15,212
1957	7,215		

Source: Division of Personnel Management, NIH.

Staff by Pay System (1948–84)

Year	Commissioned Corps	Civil Service Full-time	Other Civil Service	Total
1948	189	1,633	[1] 423	2,245
1949	251	2,061	625	2,937
1950	279	2,038	571	2,888
1951	352	2,150	510	3,012
1952	401	2,313	563	3,277
1953	473	3,110	305	3,888
1954	515	3,811	295	4,621
1955	595	4,422	395	5,412
1956	664	5,189	481	6,334
1957	761	5,806	648	7,215
1958	777	[2] 6,197	[3] 171	7,145
1959	803	6,676	1,005	8,484
1960	875	7,166	1,068	9,109
1961	943	8,026	1,206	10,175
1962	1,049	8,964	1,024	11,037
1963	1,153	9,341	1,017	11,511
1964 [4]	1,184	9,700	938	11,822
1965	1,189	9,985	1,020	12,194
1966 [5]	1,329	10,137	1,177	12,643
1967	1,248	9,392	1,090	11,730
1968	1,354	10,522	1,224	13,105
1969 [5]	1,271	10,163	1,916	13,350
1970	1,221	10,042	1,980	13,243
1971	1,190	10,939	1,873	14,002
1972 [5]	1,174	10,453	2,162	13,789
1973	1,026	10,284	1,621	12,931
1974	1,048	10,574	1,696	13,318
1975	999	10,644	2,254	13,897
1976	1,030	11,055	2,410	14,495
1977	1,001	10,972	2,865	14,658
1978	1,005	11,077	2,528	14,610
1979	972	11,135	2,332	14,439
1980	951	11,252	2,431	14,634
1981	934	11,660	2,390	14,984
1982	831	11,571	2,467	14,869
1983	779	12,092	2,578	15,449
1984	747	12,055	2,410	15,212

[1] Includes consultants, members, cooperative employees, and a few miscellaneous employees (through 1957).

[2] Includes visiting scientists and staff fellows (through present).

[3] Includes part-time and intermittent employees and excludes consultants (through present).

[4] As of Sept. 1.

[5] As of Oct. 1.

Source: Division of Personnel Management, NIH.

Full-Time Civil Service Employees by GS, 210g,[1] SES,[4] and Wage Board (1948–84)

Year	GS	210g	SES	Wage Board
1948	1,397			
1949	1,760			
1950	1,603	1		7
1951	1,712	4		8
1952	1,848	7		9
1953	2,248	8		9
1954	2,735	13		9
1955	3,513	19		890
1956	4,164	30		995
1957	4,682	44		1,080
1958	4,989	45		1,147
1959	5,324	53		1,184
1960	5,570	58		1,445
1961	6,226	82		1,597
1962	6,976	90		1,736
1963	7,294	96		1,780
1964	7,690	92		1,764
1965 [2]	7,979	95		1,777
1966 [3]	8,037	92		1,828
1967	7,315	79		1,847
1968	8,365	81		1,864
1969 [3]	8,081	80		1,781
1970	8,063	86		1,665
1971	8,474	90		1,935
1972 [3]	8,376	89		1,487
1973	8,047	84		1,489
1974	8,257	72		1,598
1975	8,398	71		1,622
1976	8,490	77		1,650
1977	8,331	79		1,526
1978	8,552	80		1,510
1979	8,447	5	190	1,538
1980	8,492	5	183	1,614
1981	8,800	5	179	1,598
1982	8,614	4	170	1,544
1983	8,873	3	167	1,559
1984	8,815	3	169	1,442

[1] Through 1955, known as Public Law 692 employees. Changed from 208g, PHS Act of 1975.

[2] As of Sept. 1.

[3] As of Oct. 1.

[4] Civil Service Reform Act of 1978.

Source: Division of Personnel Management, NIH.

Professional Staff by Type of Doctoral Degree (1958–84)

Year	M.D.	Ph. D.	D.D.S.	D.V.M.	Other [1]	Total
1958	529	431			70	1,030
1959	563	527			62	1,152
1960	594	565			61	1,220
1961	667	614			68	1,349
1962	776	604			78	1,458
1963	890	710			111	1,711
1964	961	730			134	1,825
1965	982	757			135	1,874
1966	1,150	848	50	47	48	2,143
1967	1,079	719	54	48	36	1,936
1968	1,102	781	128	47	32	2,090
1969	1,066	825	127	51	40	2,109
1970	1,010	888	127	53	44	2,122
1971	1,026	945	118	61	64	2,214
1972	1,011	995	105	62	59	2,232
1973	939	1,131	44	46	43	2,203
1974	978	1,164	43	42	35	2,262
1975	1,001	1,117	44	42	47	2,251
1976	993	1,159	58	58	44	2,312
1977	1,008	1,200	55	68	59	2,390
1978	996	1,277	53	66	59	2,451
1979	1,001	1,314	55	71	60	2,501
1980	1,054	1,413	61	73	74	2,675
1981	1,135	1,448	58	71	66	2,778
1982	1,145	1,457	57	79	58	2,796
1983	1,220	1,697	61	73	57	3,108
1984	1,251	1,799	59	74	58	3,241

[1] Includes D.D.S., D.V.M., etc., through 1965.

Source: Division of Personnel Management, NIH.

Part 5

Real Property and Facilities

Buildings

Building 1

History: Building 1 was constructed to serve as the Administration Building for NIH. Original construction plans (later changed) provided for space for various shops, a central stores operation, and a boiler plant.

Initiating legislation	June 22, 1936.
Construction begun	January 1938.
Cornerstone laid	June 30, 1938.
Construction completed	December 1938.
Occupancy by NIH	Dec. 1, 1938.
Cost of original construction	$680,746
Total cost of building (cost of original construction plus changes and improvements)	$804,963
Gross area (sq. ft.)	95,948

Space allocations (sq. ft.):

Office	33,000
Lab	1,437
Animal	
Lab Support	
Patient Care	
General Service	18,356
Public Area	23,619
Total	76,412

Present use: Administration.

Building 2

History: Building 2 was constructed as a laboratory research building. It was originally called the Industrial Hygiene Laboratory Building.

Initiating legislation	June 22, 1936.
Construction begun	January 1938.
Cornerstone laid	
Construction completed	December 1938.
Occupancy by NIH	Do.
Cost of original construction	$327,966
Total cost of building (cost of original construction plus cost of changes and improvements)	$671,233
Gross area (sq. ft.)	47,979

Space allocations (sq. ft.):

Office	5,467
Lab	14,530
Lab Support	7,069
Animal	1,268
Patient Care	
General Service	3,127
Public Area	9,325
Total	40,786

Present use: Research by NIAMDD.

Building 3

History: Building 3 was constructed to provide space for offices, laboratory research, and animal breeding. It was originally called the Public Health Methods and Animal Unit Building.

Initiating legislation	June 22, 1936.
Construction begun	January 1938.
Cornerstone laid	
Construction completed	December 1938.
Occupancy by NIH	Do.
Cost of original construction	$327,996
Total cost of building (cost of original construction plus cost of changes and improvements)	$780,117
Gross area (sq. ft.)	48,285

Space allocations (sq. ft.):

Office	2,030
Lab	13,401
Lab Support	7,253
Animal	5,680
Patient Care	
General Service	3,416
Public Area	8,936
Total	40,716

Present use: Research by NHLBI and NIAMDD.

Building 4

History: Building 4 was constructed for laboratory research for NIAMD.

Initiating legislation	June 21, 1936.
Construction begun	December 1938.
Cornerstone laid	
Construction completed	May 1941.
Occupancy by NIH	Do.
Cost of original construction	$554,573
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,027,251
Gross area (sq. ft.)	71,735

Space allocations (sq. ft.):

Office	3,771
Lab	27,899
Lab Support	6,310
Animal	3,038
Patient Care	
General Service	4,834
Public Area	14,958
Total	60,810

Present use: Research by NIAMDD.

Building 5

History: Building 5 was constructed for laboratory research by NIAID.

Initiating legislation	June 21, 1938.
Construction begun	December 1938.
Cornerstone laid	
Construction completed	May 1941.
Occupancy by NIH	Do.
Cost of original construction	$554,573
Total cost of building (cost of original construction plus cost of changes and improvements)	$986,488
Gross area (sq. ft.)	71,735

Space allocations (sq. ft.):

Office	4,410
Lab	20,321
Lab Support	8,619
Animal	8,494
Patient Care	
General Service	5,034
Public Area	14,602
Total	61,480

Present use: Research by NIAID.

Building 6

History: Building 6 was constructed as a research laboratory for NCI.

Initiating legislation	
Construction begun	
Cornerstone laid	
Construction completed	September 1939.
Occupancy by NIH	
Cost of original construction	$659,761

Total cost of building (cost of original construction plus cost of changes and improvements)	$1,289,126
Gross area (sq. ft.)	73,000

Space allocations (sq. ft.):

Office	5,664
Lab	24,799
Lab Support	8,055
Animal	2,114
Patient Care	
General Service	5,833
Public Area	15,681
Total	62,146

Present use: Research by NICHD, NEI and NIAMDD.

Building 6A

Space allocations (sq. ft.):

Office	244
Lab	3,211
Lab Support	767
Animal	
Patient Care	
General Service	1,030
Public Area	1,373
Total	6,625

Present use: Research by NICHD and NEI.

Building 7

History: Formerly called Memorial Laboratory, Building 7 was constructed as a research laboratory for the NIAID. The building has many special features (such as electrically heated grids for sterilizing air) that permit study of extremely infectious diseases.

Initiating legislation	Aug. 25, 1937.
Construction begun	July 1945.
Cornerstone laid	
Construction completed	May 1946.
Occupancy by NIH	March 1947
Cost of original construction	$1,192,634
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,335,403
Gross area (sq. ft.)	49,972

Space allocations (sq. ft.):

Office	4,018
Lab	11,808
Lab Support	5,659
Animal	1,702
Patient Care	
General Service	10,563
Public Area	10,342
Total	44,092

Present use: Research by NIAID and NINCDS.

Building 8

History: Building 8 was constructed as an office building.

Initiating legislation	
Construction begun	
Cornerstone laid	April 1945.
Construction completed	
Occupany by NIH	December 1946.
Cost of original construction	$199,614
Total cost of building (costs of original construction plus cost of changes and improvements)	$628,038
Gross area (sq. ft.)	35,200

Space allocations (sq. ft.):

Office	1,883
Lab	10,990
Lab Support	2,897
Animal	3,941
Patient Care	
General Service	4,287
Public Area	7,190
Total	31,188

Present use: Research by NCI, NIAID, and NINCDS.

Building 9

History: Building 9 was constructed to house facilties for breeding smaller animals for research.

Initiating legislation	
Construction begun	September 1942.
Cornerstone laid	
Construction completed	February 1943.
Occupancy by NIH	January 1943.
Cost of original construction	$197,451
Total cost of building (cost of original construction plus cost of changes and improvements)	$809,662
Gross area (sq. ft.)	32,500

Space allocations (sq. ft.):

Office	2,070
Lab	10,121
Lab Support	1,901
Animal	7,526
Patient Care	
General Service	1,634
Public Area	5,896
Total	29,148

Present use: Research by NINCDS, NEI, and NIMH.

Building 10

History: Building 10 was constructed as a research hospital in which laboratory research and clinical investigations with associated patient care take place.

Initiating legislation	June 14, 1948.
Construction begun	November 1948.
Cornerstone laid	June 22, 1951.
Construction completed	Aug. 26, 1955.
Occupancy by NIH	November 1952 (staff).
Cost of original construction	$30,418,308
Total cost of building (cost of original construction plus cost of changes and improvements)	$37,105,256
Gross area (sq. ft.)	1,368,193

Space allocations (sq. ft.):

Office	178,683
Lab	177,987
Lab Support	48,463
Animal	25,824
Patient Care	220,437
General Service	152,896
Public Area	327,648
Total	1,131,938

Present use: Research hospital.

Building 10A

History: Building 10A, the "Surgical Wing," was constucted to house research facilities for cardiac and neurosurgery, associated research laboratories, and the NIH Blood Bank.

Initiating legislation	1957 appropriation act.
Construction begun	August 1959.
Cornerstone laid	
Construction completed	Jan. 25, 1963.
Occupancy by NIH	Do.
Cost of original construction	$1,551,462
Total cost of building (cost of original construction plus cost of changes and improvements)	$2,165,037
Gross area (sq. ft.)	44,704

Space allocations (sq. ft.):

Office	2,708
Lab	3,325
Lab Support	668
Animal	
Patient Care	12,413
General Service	4,440
Public Area	21,483
Total	45,037

Present use: Stated above.

Buildings 11 and 11A–C

History: Buildings 11 and 11A were constructed for central utility production, including steam, compressed air, chilled water for air-conditioning systems and emergency electric power. The buildings also house the incineration plant and the GI can-washing facilities.

Initiating legislation	June 1948 and June 1949 (11-11A).
Construction begun	January 1951.
Cornerstone laid	
Construction completed	11: March 1954. 11A: June 1955. 11B: 1959. 11C: 1961.
Occupancy by NIH	11: November 1952. 11A: May 1953. 11B: 1959. 11C: 1961.
Cost of original construction	$6,240,244
Total cost of building (cost of original construction plus cost of changes and improvements)	$7,816,579
Gross area (sq. ft.)	183,352

Space allocations (sq. ft.):

Office	520
Lab	1,233
Lab Support	1,495
Animal	1,600
Patient Care	
General Service	90,567
Public Area	6,774
Total	102,189

Present use: Central utility production: boiler plant (11), incinerator (11A), additional compressors (11B-C).

Building 12

History: Building 12 was constructed to provide maintenance, overhaul, and storage facilities for NIH vehicles, and to provide general storage space. A major portion of the building has been converted to office and machine space for data processing and computer operations although the garage and fire department still are located in the building.

Initiating legislation	June 1948 and June 1949.
Construction begun	May 1949.
Cornerstone laid	
Construction completed	October 1950.
Occupancy by NIH	September 1950.
Cost of original construction	$897,842
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,537,734
Gross area (sq. ft.)	56,010

Space allocations (sq. ft.):

Office	10,467
Lab	
Lab Support	
Animal	
Patient Care	
General Service	36,506
Public Area	4,475
Total	51,448

Present use: Stated above.

Building 12-A

History: Building 12-A was authorized to permit expansion of data processing and computer operations and eventually will be used entirely for that purpose. The building presently is used as general office space for personnel of various NIH organizations including data processing.

Initiating legislation	Aug. 14, 1962.
Construction begun	Apr. 15, 1964.
Cornerstone laid	
Construction completed	Sept. 8, 1965.
Occupancy by NIH	Sept. 7, 1965.
Cost of original construction	$1,559,564
Gross area (sq. ft.)	70,623

Space allocations (sq. ft.):

Office	36,589
Lab	1,090
Lab Support	179
Animal	
Patient Care	
General Service	12,004
Public Area	10,745
Total	60,607

Present use: Stated above.

Building 12-B

Space allocations (sq. ft.):

Office	6,163
Lab	
Lab Support	
Animal	
Patient Care	
General Service	18,296
Public Area	8,256
Total	32,715

Occupants: DCRT, BISM, and DES.

Building 13

History: Building 13 was constructed to house facilities for general maintenance and repair work, scientific apparatus construction, stores and stock (including refrigerated food storage), and laundry and drycleaning facilities.

Initiating legislation	June 1948 and June 1949.
Construction begun	December 1950.
Cornerstone laid	
Construction completed	August 1952.
Occupancy by NIH	Do.
Cost of original construction	$3,324,232
Total cost of building (cost of original construction plus cost of changes and improvements)	$4,191,551
Gross area (sq. ft.)	216,615

Space allocations (sq. ft.):

Office	44,170
Lab	5,166
Lab Support	3,979
Animal	
Patient Care	15,237
General Service	95,334
Public Area	29,972
Total	193,858

Present use: General maintenance and repair work (shops), planning, construction and operating staffs (DES), laundry and drycleaning (CC), storage and supply functions (DAS), instrumentation and environmental services (DRS), employee health unit (CC), Biomedical Engineering and Instrumentation Branch and Environmental Safety Branch (DRS).

Buildings 14A-D

History: Buildings 14A through D were constructed for housing and breeding small animals, storage of animal food and bedding, cage washing and sterilization.

Initiating legislation	June 29, 1949.
Construction begun	September 1951.
Cornerstone laid	
Construction completed	November 1953.
Occupancy by NIH	February 1954.
Cost of original construction	$3,492,122
Total cost of building (cost of original construction plus cost of changes and improvements)	$3,819,630
Gross area (sq. ft.) (Buildings 14A-G)	244,457

Space allocations (sq. ft.) (14A-D):

Office	8,356
Lab	3,282
Lab Support	4,246
Animal	114,593
Patient Care	88
General Service	32,042
Public Area	63,329
Total	225,936

Present use:
A—office space and storage for animal food and bedding, cage washing, and sterilization.
B & C—for housing and breeding of small animals.
D—primate research holding and breeding, and primate cage washing.

Building 14E

History: Building 14E was constructed to house monkeys for polio research.

Initiating legislation	June 29, 1945.
Construction begun	September 1955.
Cornerstone laid	
Construction completed	January 1956.
Occupancy by NIH	February 1956.
Cost of original construction	$446,900
Total cost of building (cost of original construction plus cost of changes and improvements)	446,900
Gross area: See Buildings 14A-D.	
Space allocations: See Buildings 14A-D.	

Present use: South end—central animal surgery. North end—small animal genetic monitoring, disease investigation, and nutritional studies.

Building 14F

History: Building 14F was constructed for animal housing and breeding. From 1957 to 1963 it was used for temporary office space and was called Building T-18.

Initiating legislation	July 1956.
Construction begun	December 1956.
Cornerstone laid	
Construction completed	September 1957
Occupancy by NIH	Do.
Cost of original construction	$549,517
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,236,463
Gross area: See Buildings 14A-D.	
Space allocations: See Buildings 14A-D.	

Present use: Stated above.

Building 14G

History: Building 14G was constructed for animal housing and breeding. From 1957 to 1963 it was used for temporary office space and was called Building T-19.

Initiating legislation	July 1956.
Construction begun	December 1956.
Cornerstone laid	
Construction completed	September 1957.
Occupancy by NIH	Do.
Cost of original construction	$549,517
Total cost of building (cost of original construction plus cost of changes and improvements)	$709,681
Gross area: See Buildings 14A-D.	
Space allocations: See Buildings 14A-D.	

Present use: Houses the World Health Organization Genetic Repository for Rodents.

Building 15A

History: Building 15A was formerly the private residence of Helen Woodward Wilson. She donated it to NIH on September 30, 1938, along with a 14.4-acre tract of land.

Initiating legislation	
Construction begun	
Cornerstone laid	
Construction completed	
Occupancy by NIH	
Cost of original construction	$9,000 estimate
Total cost of building (cost of original construction plus cost of changes and improvements)	$9,400
Gross area (sq. ft.)	3,006

Present use: Living quarters for the Director, Office of Engineering Services.

Buildings 15B–G

History: Buildings 15B–G are duplex housing units constructed as officers' quarters.

Initiating legislation	June 1938.
Construction begun	December 1938.
Cornerstone laid	
Construction completed	January 1940.
Occupancy by NIH	Do.
Cost of original construction	$38,600 each $231,600 total
Total cost of building (cost of original construction plus cost of changes and improvements)	$43,462 each $260,722 total
Gross area (sq. ft.): (Each building contains two housing units)	48,384 total

Present use: Officers' quarters.

Buildings 15H and I

History: Buildings 15H and I are single housing units constructed as officers' quarters.

Initiating legislation	June 1938.
Construction begun	December 1938.
Cornerstone laid	
Construction completed	January 1940.
Occupancy by NIH	Do.
Cost of original construction	$38,600 each $77,200 total
Total cost of building (cost of original construction plus cost of changes and improvements)	$93,141
Gross area (sq. ft.)	6,006 each 12,012 total

Present use: Officers' quarters.

Building 15K

History: Building 15K was formerly the residence of Helen Woodward and Luke I. Wilson. It was donated to NIH on March 17, 1942, along with a 10.87-acre tract of land.

Initiating legislation	
Construction begun	
Cornerstone laid	1926.
Construction completed	
Occupancy by NIH	
Cost of original construction	$62,500 estimate
Total cost of building (cost of original construction plus cost of changes and improvements)	$64,548
Gross area (sq. ft.)	11,670

Space allocations (sq. ft.):

Office	4,233
Lab	214
Lab Support	2,256
Animal	
Patient Care	914
General Service	1,182
Public Area	1,117
Total	9,916

Present use: Child Research Branch, NIMH.

Building 16

History: Building 16, "Stone House," was formerly the residence of G. Freeland Peter and Lulie Whitlock Peter. It was acquired in the purchase of the Peter estate (47.9 acres) for $505,000 on February 14, 1949.

Initiating legislation	
Construction begun	
Cornerstone laid	1930.
Construction completed	
Occupancy by NIH	Dec. 20, 1950.
Cost of original construction	$133,500 estimate
Total cost of building (cost of original construction plus cost of changes and improvements)	$551,154
Gross area (sq. ft.)	17,476

Space allocations (sq. ft.):

Office	2,182
Lab	
Lab Support	
Animal	
Patient Care	
General Service	1,731
Public Area	9,708
Residential	
Total	13,621

Present use: Office and conference space.

Building 16A

History: Building 16A was formerly the residence of the caretaker for the Peter estate. It was acquired in the purchase of the Peter estate on February 14, 1949.

Initiating legislation	
Construction begun	
Cornerstone laid	
Construction completed	
Occupancy by NIH	Dec. 20, 1950.
Cost of original construction	$16,000 estimate
Total cost of building (cost of original construction plus cost of changes and improvements)	$76,731
Gross area (sq. ft.)	3,761

Space allocation (sq. ft.):

Office	1,860
Lab	
Lab Support	
Animal	
Patient Care	
General Service	332
Public Area	1,575
Total	3,767

Present use: Office space, conference space, and International Visitors Center.

Buildings 17 and 17A

History: Buildings 17 and 17A were constructed to house the 13.2 kv switchgear and associated equipment necessary for power services to the NIH reservation. The buildings were designed and constructed, and are owned by the Potomac Electric Power Co.

Initiating legislation	
Construction begun	
Cornerstone laid	
Construction completed	
Occupancy by NIH	
Cost	
Total cost of building (cost of original construction plus cost of changes and improvements)	
Gross area (sq. ft.)	7,651

Space allocation (sq. ft.):

Office	
Lab	
Lab Support	
Animal	
Patient Care	
General Service	7,168
Public Area	54
Total	7,222

Present use: Electrical power vault.

Building 18—Physiology Section, NICHD

Office	188
Lab	349
Lab Support	75
Animal	1,473
Patient Care	
General Service	12
Public Area	388
Total	2,485

Building 20

History: Building 20 was constructed as an apartment building for occupancy by certain NIH personnel.

Initiating legislation	September 1950.
Construction begun	September 1952.
Cornerstone laid	
Construction completed	November 1953.
Occupancy by NIH	January 1954.
Cost of original construction	$971,973
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,010,052
Gross area (sq. ft.)	66,880

Space allocation (sq. ft.):

Office	85
Lab	

Lab Support	
Animal	
Patient Care	
General Service	1,590
Public Area	6,685
Residential	35,915
Total	44,275

Present use: Apartment building.

Building 21

History: Building 21, formerly called Building T-3, was constructed to provide a segregated working area for use of radioisotopes.

Initiating legislation	June 22, 1948.
Construction begun	November 1948.
Cornerstone laid	
Construction completed	December 1949.
Occupancy by NIH	June 1950.
Cost of original construction	$397,648
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,009,948
Gross area (sq. ft.)	22,483

Space allocations (sq. ft.):

Office	2,513
Lab	6,113
Lab Support	2,189
Animal	
Patient Care	
General Service	5,079
Public Area	3,984
Total	19,878

Present use: Segregated working area for use of radioisotopes, especially for the preparation of "tagged" compounds and their dilution to levels at which they can be safely handled in other laboratory areas.

Building 22

History: Building 22 was constructed to house the grounds maintenance staff and equipment.

Initiating legislation	September 1950 and August 1951.
Construction begun	December 1951.
Cornerstone laid	
Construction completed	September 1952.
Occupancy by NIH	October 1952.
Cost of original construction	$178,524
Total cost of building (cost of original construction plus cost of changes and improvements)	178,524
Gross area (sq. ft.)	15,810

Space allocations (sq. ft.):

Office	615
Lab	
Lab Support	
Animal	
Patient Care	
General Service	13,970
Public Area	203
Total	14,788

Present use: Space for grounds maintenance staff and equipment.

Building 25

History: Building 25 was constructed as a chemical storage area.

Initiating legislation	June 1949.
Construction begun	
Cornerstone laid	
Construction completed	November 1953.
Occupancy by NIH	
Cost of original construction	$95,842
Total cost of building (cost of original construction plus cost of changes and improvements)	$192,525
Gross area (sq. ft.)	8,012

Space allocations (sq. ft.):

Office	76
Lab	
Lab Support	
Animal	
Patient Care	
General Service	5,533
Public Area	29
Total	5,638

Present use: Chemical storage.

Building 26

History: "Building 26," which is actually a fenced-in area, was constructed in 1954 as a temporary chemical disposal plant. In August 1958 a permanent facility was constructed on contract, and further improvements were made in August 1960.

Initiating legislation	
Construction begun	1954.
Cornerstone laid	
Construction completed	1954.
Occupancy by NIH	
Cost of original construction	$5,725
Total cost of building (cost of original construction plus cost of changes and improvements)	$37,327
Gross area: Not carried	

Present use: Chemical disposal.

Building 27

History: Building 27 was constructed as a storage area for toxic and flammable gases. Torn down in 1973.

Initiating legislation	June 1949.
Construction begun	
Cornerstone laid	
Construction completed	November 1953.
Occupancy by NIH	
Cost of original construction	$2,200
Total cost of building (cost of original construction plus cost of changes and improvements)	$2,200
Gross area (sq. ft.)	

Buildings 28, 28A-D

History: Building 28 was constructed to house the dog kennels and animal hospital.

Initiating legislation	June 1949.
Construction begun	September 1951 (Wing B and Building 28). January 1957 (Wings A, C, and D).
Cornerstone laid	
Construction completed	November 1953 (Wing B and Building 28). January 1958 (Wings A, C, and D)
Occupancy by NIH	February 1954 (Wing B and Building 28). February 1958 (Wings A, C, and D).
Cost of original construction	$687,869
Total cost of building (cost of original construction plus cost of changes and improvements)	$713,102
Gross area (sq. ft.)	26,589

Space allocations (sq. ft.):

Office	1,835
Lab	2,889
Lab Support	57
Animal	27,992
Patient Care	
General Service	1,369
Public Area	7,757
Total	41,899

Present use:

28—Office space and laboratories for the Comparative Medicine Unit.
28A—Office space and laboratories for the Comparative Pathology Section.
28B-D—long-term holding for large animals (dogs, swine, sheep).

Building 29

History: Building 29 was built to provide laboratory and office space for the Division of Biologics Standards (now Bureau of Biologics, FDA).

Initiating legislation	1956.
Construction begun	May 26, 1958.
Cornerstone laid	
Construction completed	July 21, 1960.
Occupancy by NIH	Aug. 29, 1960.
Cost of original construction	$3,257,738
Total cost of building (cost of original construction plus cost of changes and improvements)	$3,258,158
Gross area (sq. ft.)	87,898

Space allocations (sq. ft.):

Office	12,069
Lab	14,665
Lab Support	7,896
Animal	3,528
Patient Care	
General Service	16,094
Public Area	16,163
Total	70,415

Present use: Stated above.

Building 29A

History: Building 29A was authorized to provide an increase in laboratory and office space for the Division of Biologics Standards (now BoB, FDA).

Initiating legislation	October 11, 1963.
Construction begun	March 16, 1965.
Cornerstone laid	
Construction completed	November 1966.
Occupancy by NIH	November 1966.

Cost of original construction	$4,771,090
Total cost of building (cost of original construction plus cost of changes and improvements)	$5,055,210
Gross area (sq. ft.)	109,772

Space allocations (sq. ft.):

Office	3,554
Lab	12,895
Lab Support	12,240
Animal	9,822
Patient Care	
General Service	24,090
Public Area	25,068
Total	87,669

Present use: Stated above.

Building 30

History: Building 30 was constructed to provide laboratory and office space for the National Institute of Dental Research.

Initiating legislation	July 31, 1956.
Construction begun	Mar. 24, 1959.
Cornerstone laid	Sept. 21, 1960.
Construction completed	July 27, 1961.
Occupancy by NIH	May 18, 1961.
Cost of original construction	$3,447,304
Total cost of building (cost of original construction plus cost of changes and improvements)	$3,462,704
Gross area (sq. ft.)	92,601

Space allocations (sq. ft.):

Office	10,134
Lab	18,307
Lab Support	9,290
Animal	4,913
Patient Care	
General Service	15,483
Public Area	17,313
Total	75,440

Present use: Stated above.

Building 31

History: Building 31 was constructed to provide office space for most of the Institute Directors and their immediate staffs, supporting central services for this area, and additional conference space for study sections, councils, other consultant groups, and NIH staff. Building T-6 was razed in 1961 to make room for a parking lot for Building 31, and Building 15L was razed in 1962 to make room for Building 31.

Initiating legislation	July 31, 1956.
Construction begun	October 1959.
Cornerstone laid	Oct. 31, 1961.
Construction completed	April 1962.
Occupancy by NIH	Oct. 20, 1961.
Cost of original construction	$8,215,544
Total cost of building (cost of original construction plus cost of changes and improvements)	$14,605,883
Gross area (sq. ft.)	578,760

Space allocations (sq. ft.):

Office	293,276
Lab	92
Lab Support	100
Animal	
Patient Care	3,005
General Service	65,502
Public Area	121,807
Total	483,782

Present use: Stated above.

Building 32-A

History: Building 32-A was constructed for use in NIMH investigations of biology and the biochemistry of medicinal plants.

Initiating legislation	
Construction begun	July 28, 1958.
Cornerstone laid	
Construction completed	Oct. 26, 1959.
Occupancy by NIH	Feb. 9, 1959.
Cost of original construction	$120,721
Total cost of building (cost of original construction plus cost of changes and improvements)	$169,807
Gross area (sq. ft.)	4,910

Space allocations (sq. ft.):

Office	187
Lab	2,660
Lab Support	795
Animal	
Patient Care	
General Service	404
Public Area	144
Total	4,190

Present use: Stated above.

Building 34

History: Building 34 was constructed to house additional chillers for the central air conditioning system.

Initiating legislation	August 1962.
Construction begun	January 1967.
Cornerstone laid	
Construction completed	October 1968.
Occupancy by NIH	November 1968.
Cost of original construction	$2,400,000
Total cost of building (cost of original construction plus cost of changes and improvements)	$2,400,000
Gross area (sq. ft.)	46,680

Space allocations (sq. ft.):

Office	
Lab	
Lab Support	
Animal	
Patient Care	
General Service	26,115
Public Area	1,793
Total	27,908

Present use: Stated above.

Building 35

History: Building 35 was constructed to provide a cafeteria to support personnel occupying facilities in the southwestern portion of the NIH reservation.

Initiating legislation	October 1963.
Construction begun	September 1965.
Cornerstone laid	
Construction completed	November 1968.
Occupancy by NIH	February 1969.
Cost of original construction	$878,485
Total cost of building (cost of original construction plus cost of changes and improvements)	$892,517
Gross area (sq. ft.)	35,198

Space allocations (sq. ft.):

Office	346
Lab	540
Lab Support	3,435
Animal	
Patient Care	
General Service	31,711
Public Area	12,745
Total	48,777

Present use: Stated above.

Building 36

History: Building 36 was constructed to provide the NIMH and NINDS with laboratory and office space.

Initiating legislation	October 1963.
Construction begun	September 1965.
Cornerstone laid	
Construction completed	November 1968.
Occupancy by NIH	February 1969.
Cost of original construction	$11,591,985
Total cost of building (cost of original construction plus cost of changes and improvements)	$11,617,425
Gross area (sq. ft.)	233,748

Space allocations (sq. ft.):

Office	23,820
Lab	62,954
Lab Support	12,793
Animal	4,383
Patient Care	
General Service	42,857
Public Area	37,504
Total	184,311

Present use: Stated above.

Building 37

History: Building 37 was constructed to provide the National Cancer Institute with laboratory and office space.

Initiating legislation	October 1963.
Construction begun	September 1965.
Cornerstone laid	
Construction completed	November 1968.
Occupancy by NIH	February 1969.
Cost of original construction	$9,905,302
Total cost of building (cost of original construction plus cost of changes and improvements)	$9,935,863
Gross area (sq. ft.)	262,588

Space allocations (sq. ft.):

Office	23,798
Lab	65,960
Lab Support	18,553
Animal	10,447
Patient Care	
General Service	41,304
Public Area	57,149
Total	217,211

Present use: Stated above.

Building 38

History: Building 38 was constructed to house the National Library of Medicine, consisting of the largest collection of medical literature, and facilities for biomedical communications.

Initiating legislation	Aug. 3, 1956.
Construction begun	June 15, 1959.
Cornerstone laid	Dec. 14, 1961
Construction completed	Apr. 30, 1962.
Occupancy by NIH	Mar. 2, 1962.
Cost of original construction	$6,411,676
Total cost of building (cost of original construction plus cost of changes and improvements)	$6,415,776
Gross area (sq. ft.)	231,560

Space allocations (sq. ft.):

Office	74,037
Lab	
Lab Support	8,936
Animal	
Patient Care	
General Service	25,365
Public Area	113,653
Total	221,991

Present use: Stated above.

Building 38A

History: Building 38A was constructed to house the offices of the Lister Hill National Center for Biomedical Communications. The National Medical Audiovisuals Center transferred its headquarters here from Atlanta, Ga., and the Fogarty International Center occupies one floor.

Space allocations (sq. ft.):

Office	74,518
Laboratory	6,850
Lab Support	17,634
Animal	
Patient Care	
General Service	17,128
Public Area	50,553
Total	166,683

Present use: Stated above.

Building 41

History: Building 41 was constructed to provide the National Cancer Institute with a facility designed for control and containment of biohazards associated with virus studies related to cancer research.

Initiating legislation	September 1965.
Construction begun	July 1966.
Cornerstone laid	
Construction completed	April 1969.
Occupancy by NIH	May 1969.
Cost of original construction	$3,507,305
Total cost of building (cost of original construction plus cost of changes and improvements)	$3,635,503
Gross area (sq. ft.)	124,208

Space allocations (sq. ft.):

Office	4,344
Lab	11,746
Lab Support	11,858
Animal	2,211
Patient Care	171
General Service	68,229
Public Area	15,399
Total	113,058

Present use: Stated above.

Building 46

History: Building 46 was constructed to provide additional electrical service to the NIH reservation. The building houses 13.2 kw switchgear and associated equipment. The building was designed and constructed, and is owned by the Potomac Electric Power Company.

Initiating legislation	
Construction begun	
Cornerstone laid	
Construction completed	
Occupancy by NIH	
Cost of original construction	
Total cost of building (cost of original construction plus cost of changes and improvements)	
Gross area (sq. ft.)	8,536

Space allocations (sq. ft.):

Office	
Lab	
Lab Support	
Animal	
Patient Care	
General Service	9,965
Public Area	769
Total	10,734

Present use: Electrical power vault.

Multi-Level Parking–6

History: Building MLP–6 was constructed to provide parking spaces for occupants of Buildings 35, 36 and 37.

Initiating legislation	
Construction begun	July 1971.
Construction completed	July 1969.
Cost of original construction	$1,750,838
Total cost of building (cost of original construction plus cost of changes and improvements)	$1,756,696
Gross area (sq. ft.)	267,624

Space allocation

Parking space	800

Multi-Level Parking–7

History: MLP–7 was built to provide additional parking for employees in Buildings 38 and 38A.

Initiating legislation	
Construction begun	
Construction completed	May 1980.
Cost of original construction	
Total cost of building (cost of original construction plus cost of changes and improvements)	
Gross area (sq. ft.)	

Summary Data on Buildings

Building	Date of completion	Cost of original construction	Total cost[1]	Gross floor area (sq. ft.)
1	December 1938	$680,746	$804,963	95,948
2	December 1938	327,996	682,004	47,979
T2	1951	2,000	2,000	495
3	December 1938	327,996	790,888	48,285
4	May 1941	554,573	1,058,758	71,735
5	April 1941	554,573	997,259	71,735
6	September 1939	659,761	1,289,126	73,000
6-A	December 1976	833,448	833,448	9,062
7	May 1947	1,192,634	1,335,403	49,972
8	December 1945	199,614	628,038	35,200
9	February 1943	197,451	809,662	32,500
10	August 1955	30,418,308	38,575,380	1,368,193
10-A	January 1963	2,112,563	2,166,676	44,704
11	March 1954	[2]6,240,244	[2]8,219,724	[2]185,782
12	October 1950	897,842	1,949,671	56,010
12-A	February 1967	1,559,564	1,562,504	70,623
12-B	August 1977	2,180,403	2,180,403	36,936
13	October 1952	3,324,232	4,191,551	216,615
14-A	November 1953	1,688,359	1,881,088	74,639
14-B	November 1953	579,127	579,127	26,312
14-C	November 1953	579,127	579,127	26,312
14-D	November 1953	645,509	803,278	29,328
14-E	January 1956	446,900	446,900	26,650
14-F	September 1957	549,517	1,236,463	34,828
14-G	September 1957	549,517	709,681	29,388
14-T	October 1978	81,923	81,923	4,000
15-A	September 1938	9,000	9,400	3,006
15-B1, B2	January 1940	38,600	43,462	8,064
15-C1, C2	January 1940	38,600	43,462	8,064
15-D1, D2	January 1940	38,600	43,462	8,064
15-E1, E2	January 1940	38,600	70,862	8,064
15-F1, F2	January 1940	38,600	43,462	8,064
15-G1, G2	January 1940	38,600	43,462	8,064
15-H	January 1940	38,600	42,841	6,006
15-I	January 1940	38,600	88,300	6,006
15-K	March 1942	62,500	64,548	11,670
16	February 1949	133,500	551,154	17,476
16-A	February 1949	16,000	76,731	3,761
17*	Owned by Pepco			7,651
18	August 1973	328,448	328,448	3,300
20	November 1953	971,973	1,010,052	66,880
21	December 1949	397,649	1,009,948	22,483
22	September 1952	178,524	178,524	15,810
25	November 1953	95,842	212,025	8,012
26	1954	5,725	37,327	151
28	November 1953	687,869	713,102	26,589
29	July 1960	3,257,738	3,271,658	87,898
29-A	September 1968	4,771,090	5,055,210	109,772
30	July 1961	3,447,304	3,476,204	92,601
31	October 1962	8,215,544	14,605,883	578,760
32-A	October 1959	120,721	169,807	4,910
34	June 1971	2,400,000	2,400,000	46,680
35	September 1968	878,485	892,517	35,198
36	September 1968	11,591,985	11,617,425	233,748
37	September 1968	9,905,302	9,935,863	262,588
38	April 1962	6,411,676	6,415,776	231,560
41	April 1969	3,507,305	3,635,503	124,208
41-T	December 1980			3,526
46*	July 26, 1969	Owned by Pepco		8,536
52*	August 1965	Primary electric		672
53*	June 1963	Primary electric		1,800
54*	January 1940	Primary electric		168
58	October 1977	7,079	7,079	57
MLP-6	April 1971	1,750,838	1,885,700	267,624
Total		**$116,844,824**	**$142,424,242**	**5,103,722**

[1] Includes cost of original construction plus cost of changes and improvements.
[2] Includes 11, 11A, 11B and 11C.
*Transformer vaults.

Summary Data on Buildings—NIH Animal Center

Building	Date of completion	Cost of original construction	Total cost	Gross floor area (sq. ft.)
T-1	May 1960	$17,500	$18,400	4,864
T-2	May 1960	5,000	5,136	4,060
T-5	July 1960	1,666	4,196	1,745
T-6	May 1960	3,500	7,863	1,472
T-8	February 1962	118,944	344,024	18,497
T-10	January 1968	25,869	25,869	1,920
T-11	November 1967	114,916	146,302	1,024
T-12	February 1975	6,086	6,086	1,456
T-13	February 1975	8,702	8,702	2,080
100	January 1967	500,383	500,383	33,500
101	January 1967	623,032	623,032	9,600
102	January 1967	1,060,152	1,060,152	54,500
103	June 1972	836,684	860,378	22,018
107	July 1972	476,659	476,659	772
110	June 1972	297,046	318,240	7,817
111	June 1972	176,738	197,932	4,651
112	February 1968	123,074	146,446	8,282
115	June 1974	23,500	23,500	345
116	January 1967	31,114	31,114	2,400
117	January 1967	31,114	31,114	2,400
127	February 1968	91,161	91,161	1,456
128	September 1967	107,868	107,868	1,620
130	April 1977	29,207	29,207	1,020
131	December 1968	11,500	11,500	286
Reservoir	January 1967			
Water fowl habitat.	June 1972	36,115	36,115	([1])
Total		**$4,757,530**	**$5,111,379**	**187,785**

[1] 3 acres.

Acquisition of Land

Method and source of acquisition	Date acquired	Number of acres	Original estimated value or actual cost	Buildings now located on parcel
National Institutes of Health				
Bethesda, Md.				
Donated by Helen Woodward Wilson and Luke I. Wilson. Consideration $10.	Deed dated 8-10-35 and recorded 9-11-35.	44.956	[1] $74,932	1, 2, 3, 4, 5, 7, 8, 9, 10 (part), 17, 21.
Donated by Helen Woodward Wilson Consideration $10.	Deed dated 5-28-38 and recorded 6-20-38.	10.65	[1] 17,670	6, 15D, 15E, 15G.
Donated by Helen Woodward Wilson Consideration $1.	Deed dated 9-30-38 and recorded 10-1-38.	14.437	[1] 24,055	15A, 15B, 15C, 15F, 15H, 15I.
Do	Deed dated 9-27-40 and recorded 9-27-40.	11.583	[1] 19,304	31.
Donated by Helen Woodward Wilson Consideration $5.	Deed dated 3-17-42 and recorded 3-28-42.	10.87	[1] 18,120	15K.
Purchased from Sisters of Visitation	Condemnation judgment issued on declaration of taking 9-23-48. Receipt of final payment acknowledged 6-28-49.	50.1461	173,058	10 (part), 10A, 20.
Purchased from G. Freeland Peter and Lulie Whitlock Peter.	Deed dated 2-14-49.	47.9028	505,000	11-11A (part), 11B-C, 12, 12A, 13 (part), 14B-D (part), 14F-G (part), 16, 16A, 17A, 22, 25, 26.
Purchased from Town & Country Golf Club, Inc.	Deed dated 2-11-49 and recorded 2-14-49.	115.84	600,000	11-11A (part), 13 (part), 14A, 14B-D (part), 14E, 14F-G (part), 28A-D, 29, 29A, 30, 32, 34, 35, 36, 37, 38, 38A, 41, 46.
Donated by Richard and Annette Bloch, Mr. and Mrs. Kenneth Jonsson, Alan I. Kay, Abe and Irene Pollin, Mr. and Mrs. J. Allan Sheehan, the Wald Foundation—in memory of Alex Wald, and other donors to the NCI Gift Fund.	December 16, 1982		1,400,000	82
Field Stations				
NIH Animal Center, Poolesville, Md.				
Purchased from Harold E. Luber, Rhoda Luber and Isador Brill.	Deed dated 5-6-60 and recorded 5-11-60.	498.98	108,300	100, 101, 102, 103, 107, 110, 111, 112, 115, 116, 117, 127, 128, 130, 131, T-1, T-2, T-5, T-6, T-8, T-10, T-11, T-12, T-13, M1-M8.
Purchased from Bernard N. Siegel	Civil No. 15332 judgment on the declaration of taking. Filed 2-24-64. Final settlement 4-11-67.	13.804	9,267	None.
Gerontology Research Center, Baltimore, Md.				
Donated by Baltimore City	Deed dated 12-6-62 and recorded 2-1-63.	4.945	[2] 99,000	Gerontology facility valued at $7,890,691 with 210,000 sq. ft.

Acquisition of Land—Continued

Method and source of acquisition	Date acquired	Number of acres	Original estimated value or actual cost	Buildings now located on parcel
Rocky Mountain Laboratory, Hamilton, Montana				
Quit Deed from State of Montana (Parcel A).	Deed dated 12-17-31 and recorded 1-27-32..	2.70	.....	
Quit Deed from Valley Mercantile Company (dissolved) (Parcel).	Deed dated 9-23-37.....	0.06	.....	
Purchased from Valley Mercantile Company (Parcel B).	Deed dated 6-9-34.....	1.29	.....	
Purchased from City of Hamilton (Parcel D).	Deed dated 10-5-37.....	0.75	.....	
Purchased from William A. Bower (Parcel E).	Deed dated 3-11-39.....	27.76	.....	
Purchased from Wm. & Anna Grimes (Parcel F).	Deed dated 3-24-39.....	0.64	.....	
Total.....	.....	33.20	86,423	Buildings valued at $2,680,229 with 143,876 sq. ft.
Puerto Rico Sabana Seca				
Transferred from Department of the Navy...	Transferred 6-14-67.....	270	.....	[2] 358,861 8 buildings valued at $307,748 with 11,769 sq. ft., roads $16,600, land $75,181.
Research Triangle Park, N.C.				
Donated by the Research Triangle Foundation of North Carolina.	Deed dated 6-26-67 and recorded 9-28-67.	509.20	.....	
Leased property.....	Buildings leased or owned by U.S. Government on leased property.	40	.....	19 buildings valued at $5,720,666 with 165,751 sq. ft.
Frederick Cancer Research Facilities Frederick, Md.				
Transferred from U.S. Army.....	Transferred 9-30-77.....	68.61	.....	59 buildings valued at $27,317,212 with 792,634 sq. ft., roads, $235,500 and land, $28,499.

[1] Estimated value obtained from Montgomery County assessment records.
[2] Estimated value.

Perrine, Fla.				
.....	Transferred 1-1-82.....	58.5	.....	3 buildings valued at $1,190,000 and land, $2,295,000.

Estimated Cost [1] of Facilities Serving NIH Buildings

Facility	Cost
Fences	$54,428
Water distribution system, including fire hydrants and wells	121,948
Chilled water distribution system	2,577,948
Gas distribution system	31,669
Compressed air distribution system	10,324
Electrical distribution system	2,194,853
Steam distribution system	293,542
Sanitary sewer system	209,284
Storm sewer system	442,878
Chemical disposal	37,327
Surface areas:	
Roadways and related bridges	548,581
Sidewalks and related bridges	63,775
Parking areas	828,548
Tennis courts	20,172
Total	$7,435,277

[1] The actual cost of facilities was used when available. However, in most cases the construction cost of a building or group of buidings included the facilities serving those buildings, in which case the cost was estimated at prices applicable at the time of construction, and the estimated cost of facility was deducted from the cost of the building.

Source: DES; PCB.

Estimated Cost of Facilities Serving NIH Animal Center Buildings

Facility	Cost
Fences	$243,914
Water distribution system, including hydrants and wells	160,900
Water storage tower	73,550
Chilled water distribution system	65,000
Well houses and 4 wells	18,092
Electrical distribution system	431,709
Steam distribution system	215,527
Sanitary sewer system	700,990
Storm sewer system	132,194
Surface areas:	
Roadways and related bridges	180,091
Total	$2,221,967

Utilities [1]

(Fiscal year 1981)

Utility	Cost
Heating (fuel oil)	$7,024,000
Water	1,591,000
Electricity	9,993,000
Gas (bunsen burners, etc.)	31,000
Deionized water	8,000
NIHAC water pollution control plant	4,000
Telecommunications (includes telephone, data and teletype equipment charges, commercial toll charges, FTS service, field stations, and reimbursable charges)	14,186,000
Total	$32,837,000

[1] Utility costs for the NIH reservation at Bethesda, Md., and the NIH Animal Center, Poolesville, Md.

Sources: Budget Office, DES; Telecommunications Branch, DAS.

NIH Leased Facilities

(As of Sept. 30, 1983)

Blair Building, 8300 Colesville Road, Silver Spring, Md.:
Total leased area ..... 53,555 sq. ft.
Use ..... Office.

Danac Warehouse, 12725 Twinbrook Parkway, Rockville, Md.:
Total leased area ..... 60,000 sq. ft.
Use ..... Warehouse.

Federal Building, 7550 Wisconsin Avenue, Bethesda, Md.:
Total leased area ..... 101,899 sq. ft.
Use ..... Office.

Landow Building, 7910 Woodmont Avenue, Bethesda, Md.:
Total leased area ..... 104,071 sq. ft.
Use ..... Office.

Westwood Building and Annex, 5331 Westbard Avenue, Bethesda, Md.:
Total leased area ..... 435,003 sq. ft.
Use ..... Office.

NIEHS Warehouse, Durham Raleigh Rd., Research Triangle Park, NC:
Total leased area ..... 22,470 sq. ft.
Use ..... Warehouse.

Bioqual, Inc., 5708A Fredrick Avenue, Rockville, Md.:
Total leased area ..... 2,750 sq. ft.
Use ..... Animal.

Grand Slam Warehouse, Page Rd. & I–40, Research Triangle Park, NC:
Total leased area ..... 9,697 sq. ft.
Use ..... Warehouse.

Framingham Union Hospital, 118 Lincoln St., Framingham, Mass.:
Total leased area ..... 4,538 sq. ft.
Use ..... Clinical.

Framingham Union Hospital 224 Union Ave., Framingham Mass.:
Total leased area ..... 1,434 sq. ft.
Use ..... Clinical

Twinbrook No. 1, 5640 Fishers La., Rockville, Md.:
Total leased area ..... 7,555 sq. ft.
Use ..... Laboratory, Office.

Research Plaza Building, Highway 70–A, Research, Triangle Park, NC:
Total leased area ..... 7,502 sq. ft.
Use ..... Office.

Triangle Service Center, Inc., Research Triangle Park, N.C.:
Total leased area ..... 38,004 sq. ft.
Use ..... Animal, Laboratory, Office.

McCarthy Associates, Research Triangle Park, N.C.:
Total leased area ..... 30,029 sq. ft.
Use ..... Animal, Laboratory, Office.

Park Building, 12420 Parklawn Drive, Rockville, Md.:
Total leased area ..... 19,440 sq. ft.
Use ..... Laboratory, Office.

Marine Biological Laboratory, Woods Hole, Mass.:
Total leased area ..... 4,400 sq. ft.
Use ..... Laboratory, Office, Animal.

Federal Building, 301 W., Congress, Tucson, AZ:
Total leased area ..... 162 sq. ft.
Use ..... Office.

John Garvey, 179 Union Avenue, Framingham, Mass.:
Total leased area ..... 340 sq. ft.
Use ..... Storage.

Baltimore City Hospitals, 4940 Eastern Avenue, Baltimore, Md.:
Total leased area ..... 600 sq. ft.
Use ..... Treatment.

Part 6
Field Units

Honolulu Heart Disease Epidemiology Study, NHLBI Honolulu, Hawaii

A cooperative prospective epidemiological study involving 8,006 Japanese-American men have been conducted by a team of NHLBI investigators and researchers at Kuakini Hospital and the University of Hawaii School of Public Health since 1965. Coronary heart disease rates in these men were found to be two times greater than in Japan, however, Japanese-American men still had only one-half the rate of CHD as found in Framingham men.

CHD risk factors in Japanese-American men include high blood pressure, elevated serum cholesterol, cigarette smoking, high response to glucose load and diabetes, obesity and ECG findings of LVH. Protective factors for CHD include plasma high-density lipoproteins, moderate alcohol intake, increased intake of starch and complex carbohydrates, increased energy expenditure and exposure to Japanese culture in childhood.

Cerebrovascular disease (stroke) rates in Japan were three times that of Japanese descent men in Honolulu. Risk factors for stroke were high blood pressure, high alcohol intake and for hemorrhagic stroke a low cholesterol level. Very low cholesterol level was also associated with increased incidence of cancer of the colon.

Extensive clinical, laboratory and necropsy data extend knowledge of risk factors and protective factors for coronary heart disease, hemorrhagic and nonhemorrhagic stroke and on certain cancers.

This study is being conducted in parallel with studies of the Radiation Effects Research Foundation in Hiroshima and Nagasaki, Japan.

Guam Research Center, NINCDS

Since 1957, the unusual frequency of a disorder resembling amyotrophic lateral sclerosis (ALS) among the Chamorro population native to Guam has been studied by NINCDS's intramural program. A field research unit was established on Guam, where the ALS-like motor neuron disease is over 100 times more common than is ALS in the continental United States, to conduct field surveys and to obtain materials for further serologic, hematologic, neuropathologic, and genetic studies. An abnormally high incidence of parkinsonism-dementia complex (a form of progressive extrapyrimidal disease) has also been noted in this region. Data gathered on Guam over the years will now permit the testing of specific research hypotheses involving certain types of ALS and parkinsonism-dementia patients. Current research is being coordinated by the NINCDS Neuroepidemiology Branch.

Framingham Heart Disease Epidemiology Study, NHLBI Framingham, Mass.

This long-term study was transferred to the National Heart Institute on July 1, 1949. Designed to investigate factors involved in the development and progression of heart disease, comprehensive examinations have been given at 2-year intervals to approximately 5,000 study participants randomly selected from those of the community population aged 30 to 59 at the time of their first examination. With knowledge gained as increasing numbers of the participants developed heart disease, stroke, and peripheral vascular disease over the years, the study is providing information on the factors that increase the risk of heart disease and the relative importance of such risk factors in determining incidence and death from these causes.

Collaborative studies with the National Eye Institute and National Institute on Aging are now extending knowledge into other common disabilities of these men and women into ages 60–90.

Gerontology Research Center, NIA Baltimore, Md.

The Gerontology Research Center, formerly part of the National Heart Institute, was transferred to the National Institute of Child Health and Human Development in December 1965 and to the new National Institute on Aging in July 1975.

With the transfer of this center, all major aging and research training activities of NIH were consolidated in NIA.

Located on the grounds of the Francis Scott Key Medical Center, a Johns Hopkins medical institution, GRC's laboratories emphasize: investigation of the basic biological mechanisms of aging; description and interpretation of age changes in the various organ systems of human beings; and characterization and explanation of overall changes in performance and behavior which accompany the aging process. Its programs encompass a longitudinal study of some 1,000 healthy men and women, ranging in age from the twenties to the nineties. These volunteers come to Baltimore every 2 years for 2½ days of testing to measure individual age changes.

A multimillion-dollar Gerontology Research Center building was completed and opened in June 1968. The facilities and resources available at this center are the most comprehensive in the country committed to research in aging. The center serves as a focal point for regional and national research in aging, and houses NIA intramural research and postdoctoral gerontology training activities.

The programs are organized into the Office of the Scientific Director, Clinical Physiology Branch, Laboratory of Cellular and Molecular Biology, Laboratory of Behavioral Sciences, Laboratory of Molecular Aging, and Laboratory of Neurosciences. The latter laboratory is located at the NIH Clinical Center in Bethesda, Md.

Rocky Mountain Laboratories, NIAID
Hamilton, Mont.

The earliest studies of Rocky Mountain spotted fever were begun at this laboratory in 1902. It was formally established as a PHS field station in 1921. Although the Rocky Mountain Laboratory remains a center for the study of medically important ticks and diseases transmissible from animals to man, a recent reorganization has diversified the laboratory focusing research on the basic cellular level.

Since March 1979, three new laboratories have been established at the RML facility: the Laboratory of Microbial Structure and Function, the Laboratory of Persistent Viral Diseases, and the Laboratory of Pathology. This reorganization permits the continuation of important studies on the natural history and epidemiology of sexually transmitted bacterial diseases and the study of slow virus diseases. It also includes the development of research at the molecular level into the problems of host-microbe relationships. These new capabilities allow RML scientists to become more involved in the diagnosis and treatment of important infectious diseases. One early effort has been the development of a new pertussis vaccine. Facilities and a biomedical research program to address the problems of diagnosis, prevention and treatment of AIDS have also been developed at the Rocky Mountain Laboratories.

NIH Animal Center, DRS
Poolesville, Md.

The Veterinary Resources Branch operates a specialized laboratory animal center situated on 513 acres of farmland located 8 miles southwest of Poolesville, Md., near the Potomac River. The cost of the land, purchased in 1960, was $146,689. A construction program, ultimately to provide permanent buildings and associated facilities costing $18 million, began in 1963. The first phase was completed in May 1965 and included a farm animal building, a kennel building, and a powerplant, together with necessary water, sewers, electric power, steam, chilled water, and paved access roads. Two dwellings were also constructed for resident personnel. A building for research holding as well as quarantine and conditioning of nonhuman primates was completed in May 1971. Also finished were buildings being used by the National Institute of Mental Health for its Laboratory of Brain Evolution and Behavior.

The Animal Center is a major extension of animal holding and production facilities at Bethesda. Programs of the Institutes include studies of animal behavior, conduct of immunologic procedures and sampling, and surgical investigation in larger animals. The size and character of the animal population varies in response to changes in research programs. Illustrative of the diversity and current scale of operations at the Animal Center are the population figures as of October 1982.

Horses	9
Burros	63
Sheep	307
Goats	134
Cattle	3
Swine	297
Dogs	842
Cats	205
Avian	26
Nonhuman primates	1,101

Laboratory of Biophysics, NINCDS
Woods Hole, Mass.

The laboratory is concerned with molecular and cellular mechanisms involved in nerve excitation, nerve structure, membrane potentials, the nerve impulse, synaptic activity and sensory transduction. The biophysics of simple nervous systems and the cellular basis for such integrative functions as learned behavior are being studied, as are developmental determinates of neural networks.

Emphasis is placed on membrane ionic channel structure and function. Model systems are derived, tested, and used to simulate neuronal function under a variety of natural and experimental

conditions. Subcellular structures supportive of axoplasmic transport and membrane ionic channel formation are sought. The physical mechanisms involving the structures of nerve are probed and these are related to both the biochemical and structural elements underlying these mechanisms.

The office of the chief and two of the laboratory's three sections were established at the Marine Biological Laboratory in Woods Hole in October 1975.

Part 7

Lectures, Nobel Laureates, Honors, Exhibits, and Symposia

The R. E. Dyer Lectures

To honor Dr. Rolla Eugene Dyer, former Director of NIH, the R. E. Dyer Lectureship was founded when he retired in September 1950. The lectureship awards are made for outstanding contributions to medical or biological knowledge, and the recipient chooses his subject. The following lectures have been given:

June 21, 1951
"Genetic Control of Metabolism"
George W. Beadle

October 29, 1952
"The Virus and the Cell"
Sir F. MacFarlane Burnet

October 22, 1953
"The Gold-Headed Cane in the Laboratory"
Rene J. Dubos

November 17, 1954
"Recent Observations on the Behavior of Tissue Culture of Certain Viruses Pathogenic for Man"
John Franklin Enders

January 31, 1956
"The Properdin System"
Louis Pillemer

February 19, 1957
"The Natural History of Plague and Psittacosis"
Karl F. Meyer

November 5, 1957
"Influenza: History, Epidemiology and Speculation"
Richard E. Shope

December 16, 1958
"Microbial Persistence and Latency"
Walsh McDermott

December 1, 1959
"Immunofluorescence"
Albert H. Coons

November 15, 1960
"Epidemiologic Models in Vector-Borne Disease Studies"
George Macdonald

January 10, 1962
"Messages in Macromolecules"
Rollin D. Hotchkiss

April 24, 1963
"How Does a Virus Work"
Salvador E. Luria

April 29, 1964
"The Malignant Transformation of Cells by Viruses"
Harry Rubin

April 7, 1965
"The Territory of Epidemiology"
Alexander D. Langmuir

April 27, 1966
"Viral Oncogenesis or Subversion at the Cellular Level"
Karl Habel

April 26, 1967
"Development and Involution of Lymphoid Tissue and Immunologic Capacities"
Robert Alan Good

April 24, 1968
"Test-tube Studies of a Self-Duplicating RNA Molecule"
Sol Spiegelman

April 9, 1969
"Viral and Cellular Interactions: The Mechanisms of Actions of Supraoptimal Temperature on the Development of Poliovirus"
André Lwoff

December 17, 1969
"Cell Selection and Cooperation in the Immune Response"
Baruj Benacerraf

May 12, 1971
"Mechanism of Cell Transformation by DNA and RNA Tumor Viruses"
Maurice Green

April 19, 1972
"The Inflammatory Response: Appreciation of Amplification and Control Mechanisms"
K. Frank Austen

January 24, 1973
"Influenza: The Last of the Great Plagues—Genetic Approaches to the Understanding and Control of an Infectious Disease"
Edwin K. Kilbourne

February 6, 1974
"The Replication and Possible Origin of RNA Viruses With a DNA Polymerase"
Howard M. Temin

November 6, 1974
"Kuru"
D. Carleton Gajdusek

September 29, 1976
"Selective Expression of *I* Region Genes in Lymphocyte Subpopulations"
Hugh O. McDevitt

May 31, 1978
"Influenza Virus: Recent Insights and Prospects for Effective Control"
Robert M. Chanock

October 18, 1978
"Gene Transfer in Mammalian Cells"
Frank Ruddle

March 14, 1979
"Structural and Genetic Approaches to the Study of Antibody Complementarity"
Elvin A. Kabat

February 25, 1981
"Somatic Variation in Immunoglobulin Production by Mouse Myeloma Cells"
Matthew D. Scharff

May 12, 1982
"The Three-Dimensional Structure of the Antibody Molecule: Specificity and Diversity"
Michael Potter and David Davies

December 14, 1983
"Human Tumor Viruses: The Search for Some Is Over"
Robert C. Gallo

NIH Lectures

The NIH Lecture Series was established to facilitate interchange of information and to give appropriate recognition for outstanding scientific accomplishment. Since January 1953, the various Institutes and the Office of the Director have sponsored lectures. The series has been planned to recur each year, with the lectures published and distributed to scientific libraries, universities, medical schools, and other appropriate depositories. Lectures are open to the scientific staff at NIH and at other medical, teaching, and research institutions in the Washington, D.C., area. As part of the NIH Lecture Series, an annual G. Burroughs Mider Lectureship Award was established in 1968 in honor of the first NIH Director of Laboratories and Clinics, to be presented by a member of the NIH intramural staff in "recognition and appreciation of outstanding contributions to biomedical research." The following lectures have been given:

January 21, 1953
"Tricarboxylic Acid Cycle: Enzymatic Mechanisms"
Severo Ochoa

September 24, 1953
"Enzymatic Analysis of the Structure of Starch and Glycogen"
Carl F. Cori

September 30, 1954
"The Natural History of Changing One's Job"
Alan Gregg

December 16, 1954
"Avirulent Strains of Poliomyelitis Virus—Segregation, Characterization, Role in Nature, and Potential Usefulness for Human Immunization"
Albert B. Sabin

May 31, 1955
"Some Recent Developments Concerning the Chemical Transmission of Nervous Effects"
Sir Henry Hallett Dale

May 1, 1957
"The Nature of Molecular Disease"
Linus Pauling

January 22, 1958
"Relation of Physical Science to Life Science: Communication Theory"
W. O. Baker

May 14, 1958
"Bioenergetics"
Albert Szent-Gyorgyi

October 7, 1958
"The Energy Exchanges Involved in Muscular Contraction and Nerve Conduction"
Archibald Vivian Hill

May 5, 1959
"The Biochemical Evolution of Vision"
George Wald

October 13, 1959
"Biosynthesis of Deoxyribonucleic Acid (DNA)"
Arthur Kornberg

February 9, 1960
"Biosynthesis in Human Cell Cultures"
Harry Eagle

April 26, 1960
"From Fish to Philosopher"
Homer W. Smith

May 18, 1960
"The Biologist Examines the Mind and Behavior"
Seymour S. Kety

October 4, 1960
"Conscious Experience—What the Brain Records and Where"
Wilder Penfield

December 14, 1960
"An Enzymatic Approach to Nucleic Acid Chemistry"
Leon A. Heppel

January 25, 1961
"Inquiries Concerning the Fine Structure of Protein Molecules"
John T. Edsall

March 15, 1961
"Viruses, Common Colds and Cancer"
Robert J. Huebner

November 15, 1961
"Endocrine Aspects of the Cancer Problem"
Roy Hertz

February 28, 1962
"Relationship Between Structure and Host Reactive Properties of Microorganisms"
Edgar Ribi

April 25, 1962
"Photosynthesis"
Melvin Calvin

October 17, 1962
"Status of Transuranium Elements"
Glenn T. Seaborg

December 12, 1962
"Intercellular Infection and the Carrier State"
Joseph E. Smadel

February 27, 1963
"The History and Natural History of Gout"
DeWitt Stetten, Jr.

September 5, 1963
"Cardiovascular Surgery—Past and Present"
Alfred Blalock

December 4, 1963
"On the Nature of the RNA Code"
Marshall W. Nirenberg

February 5, 1964
"Studies in the Sociology of Science"
Robert E. Merton

February 19, 1964
"Controlling Elements and Regulatory Circuits in Cellular Metabolism"
Jacques Monod

October 20, 1964
"Some Biological Implications of Protein Structure"
Christian B. Anfinsen

December 15, 1964
"Research in Education"
Jerome Wiesner

January 13, 1965
"Giant Nerve Fibres"
Alan L. Hodgkin

October 20, 1965
"Tissue Remodeling Mechanisms In Amphibian Metamorphosis"
Jerome Gross

December 8, 1965
"Tissue Transplantation: Past, Present and Future"
Rupert E. Billingham

February 9, 1966
"Quantitative Measures of Size and Significance and Relatedness of Scientific Literature"
Derek de Solla Price

November 2, 1966
"The Cellular Regulation of Branched Biosynthetic Pathways"
Earl R. Stadtman

December 7, 1966
"The Natural History of Some Small Brains"
Caryl Parker Haskins

February 8, 1967
"Recent Studies on Microsomes"
George E. Palade

October 25, 1967
"The Pineal Gland, a Biological Clock"
Julius Axelrod

December 13, 1967
"Developmental Biology: The Richness of New Opportunity"
James D. Ebert

February 21, 1968
"Operant Conditioning and the Mangement of Human Behavior"
Burrhus F. Skinner

October 30, 1968
"On the Synthesis and Functions of Glutamine and Asparigine"
Alton Meister

December 11, 1968*
"Control of Gene Activity in Higher Organisms"
Gordon M. Tomkins

February 12, 1969
"The Role of Mathematical Models in Sciences"
Mark Kac

March 11, 1970*
"Tumor Antigens: Their Origins, Characteristics and Significance"
Lloyd W. Law

April 22, 1970
"Genetic Dissection of Visual Behavior in Drosophila"
Seymour Benzer

October 21, 1970
"Viewing Living Synapses and Exploration of the Chemosensitivity of the Neuronal Surface"
Stephen William Kuffler

December 2, 1970
"Fructose Diphosphatase and the Control of Gluconeogenesis"
Bernard L. Horecker

December 16, 1970*
"Genetic Mismanagement of Complex Lipids"
Roscoe O. Brady

October 7, 1971
"The Analysis of Malignancy by Cell Fusion"
Henry Harris

January 19, 1972
"The Replication of Single-Stranded DNA Bacteriophages: Facts and Riddles"
Robert L. Sinsheimer

February 9, 1972*
"Survival Mechanisms of the Triune Brain: Some Hopeful Aspects"
Paul D. MacLean

March 15, 1972
"Science and Trans-Science"
Alvin M. Weinberg

October 25, 1972
"Tensile Water"
Per F. Scholander

November 8, 1972
"Behavior of Chimpanzees and Their Natural Habitat"
Jane Goodall

March 14, 1973*
"Genetic Factors in the Transmission and Expression of Murine Leukemia Virus"
Wallace P. Rowe

April 11, 1973
"The Hormones of the Hypothalamus"
Roger Guillemin

October 17, 1973
"The Changing Significance of Territoriality in Human Societies"
Margaret Mead

November 7, 1973*
"Cyclic AMP and the Transformation of Cells"
Ira H. Pastan

December 12, 1973
"Probing Into Immunological Phenomena: From Molecule to Cell"
Michael Sela

March 20, 1974
"Some Phases of Oxidative Hydroxylation of Steroids in the Animal Organism"
Percy Julian

April 24, 1974
"The Prostaglandins-Bioregulators With Clinical Implications"
Sune Bergström

October 9, 1974*
"Inherited Lysosomal Disorders Studied in Cell Culture"
Elizabeth Neufeld

March 26, 1975
"Ion Transport in Reconstituted Systems and in Cancer Cells"
Efraim Racker

April 9, 1975
"Visual Deprivation and Its Effects on the Monkey Striate Cortex"
Torsten N. Wiesel

September 10, 1975*
"Collagen: Its Chemistry, Structure, and Function"
Karl A. Piez

November 17, 1976
"Dissections and Reconstruction of the SV40 Genome"
Paul Berg

December 8, 1976
"Cell Surface Modulation"
Gerald Edelman

March 2, 1977
"Early Man"
Mary Leakey

May 18, 1977*
"Monkey Business: Sequences in the Monkey Genome and Their Interaction With Simian Virus 40 DNA"
Maxine F. Singer

November 2, 1977*
"A Close and Surprising Look at the Mammalian Genome"
Philip Leder

March 29, 1978
"Cellular Insights Into Behavior and Learning"
Eric Kandel

May 10, 1978
"Total Synthesis of a Biologically Functional Gene"
Har Gobind Khorana

September 13, 1978*
"Receptor Disorders in Man"
Jesse Roth

December 6, 1978
"Turning Cancer Cells Into Mice"
Beatrice Mintz

May 2, 1979
"Gene Amplication and Methotrexate Resistance in Cultured Mammalian Cells"
Robert T. Schimke

June 13, 1979
"In Rodin's Studio"
Albert Elsen

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*G. Burroughs Mider Lecture.

September 12, 1979
"Drugs, Neurotransmitters, and the Brain"
Solomon H. Snyder

October 17, 1979*
"Regulation of Cyclic Nucleotide Metabolism"
Martha Vaughan

November 28, 1979
"The Structure and Evolution of Genes"
Walter Gilbert

February 27, 1980*
"The Control of the Immune Response: Regulatory Cellular Interactions and the Control of Lymphocyte Differentiation"
Thomas Waldmann

May 7, 1980
"Hepatitis B Virus and the Pathogenesis and Prevention of Cancer of the Liver"
Baruch S. Blumberg

October 1, 1980
"Mutational Analysis of a Viral Replicon"
Daniel Nathans

December 10, 1980*
"Metabolic Mapping of Local Functional Activity in the Central Nervous System"
Louis Sokoloff

May 27, 1981
"The Current Status of the Hepatic Membrane Receptor for Desialylated Serum Glycoproteins"
Gilbert Ashwell

December 2, 1981
"Cell Surface Receptors for Plasma Lipoproteins: Implications for Biology and Medicine"
Joseph L. Goldstein

September 15, 1982*
"Living With Lymphocytes, or B Lymphocytes and How They Grow"
William E. Paul

October 27, 1982
"Information Processing in a Simple Sensory System: Bacterial Chemotoxis"
Daniel E. Koshland, Jr.

November 17, 1982
"Autoantibodies as Probes for Small Ribonucleoproteins From Eukaryotes"
Joan A. Steitz

January 25, 1984
"Charge Distribution, Electrostatic Fields, and Enzyme Function"
Frederic M. Richards

March 21, 1984
"Cancer Genes Come of Age"
J. Michael Bishop

April 18, 1984*
"Movement, Mood and Memory: Linked Functions in the Mammalian Brain"
Edward V. Evarts

September 12, 1984*
"Enhancers: Regulatory Elements in Eukaryotic Gene Expression"
George Khoury

November 7, 1984
"Neuronal Replacement in Adulthood and Its Possible Relation to Learning"
Fernando Nottebohm

November 28, 1984
"Gene Expression in Developing and Adult Neurons"
Richard Axel

December 5, 1984
"Managing the Deficit"
Alice Rivlin

December 12, 1984
"Twenty Years A' Growing"
S. Dillon Ripley

*G. Burroughs Mider Lecture.

The Jules Freund Lectures

The Jules Freund Lecture series was established in 1961 and is presented annually in honor of Dr. Jules Freund, first chief of the Laboratory of Immunology, NIAID.

November 15, 1961
"Studies of Hypersensitivity to Simple Chemical Allergens"
Merrill W. Chase

October 17, 1962
"Chemical Constitution and Immunological Specificity of Polysaccharides"
Michael Heidelberger

October 7, 1963
"Autosensitization in Animals and Man"
Ernest Witebsky

October 7, 1964
"Pleuropneumonia-like Organisms and L-forms of Bacteria"
Louis L. Dienes

September 29, 1965
"Mechanisms of Intracellular Infection"
Rene Jules Dubos

October 13, 1966
"Problems of Antibody Biosynthesis"
Felix Haurowitz

October 20, 1967
"Immunochemical Analysis of Tissue Constituents"
Pierre Grabar

November 6, 1968
"Whither the Search for Viral Etiology of Human Cancer?"
Albert Sabin

November 3, 1969
"Blood Group A, B, H, and Le Substances—Their Chemistry and the Nature of Their Reaction With Antibodies and Other Specific Hemagglutinins"
Elvin A. Kabat

October 19, 1970
"Serum, pH, and the Contact Inhibition of Normal Human Cells"
Harry Eagle

November 18, 1971
Myeloma Proteins as Antibodies and Tumor-Specific Antigens"
Herman N. Eisen

November 17, 1972
"Mycoplasmas as Candidates for Vascular Pathogenicity"
Lewis Thomas

November 26, 1974
"The Task of Seeing the Virus and Host as Non-Separate Realities"
Hilary Koprowski

The Kinyoun Lectures

The Kinyoun Lecture series was established by the National Institute of Allergy and Infectious Diseases in 1979 to honor Dr. Joseph J. Kinyoun who, in 1887, established the small Laboratory of Hygiene at the Marine Hospital on Staten Island, the predecessor of the National Institutes of Health. NIAID is the direct lineal descendent of the Laboratory of Hygiene within the NIH. These lectures will, for the most part, emphasize the interdependence of infection and immunity.

April 24, 1979
"The Role of Complement in Natural Resistance to Infections"
Hans J. Muller Eberhard

May 8, 1979
"Cell-Mediated Immunity to Intracellular Parasites and Polymorphic Major Transplantation Antigens"
Rolf M. Zinkernagel

October 9, 1979
"Host Proteases and Virus Virulence: The Unkindest Cut"
Purnell W. Choppin

November 27, 1979

"Transplantation Experiments in Nature and Their Biological Significance"
Rupert Billingham

March 5, 1980

"Fatal Infectious Mononucleosis and Polyclonal B Cell Lymphoma"
Dorothy Horstman

May 5, 1980

"The Molecular Cloning of *E. Coli* Enterotoxin Genes
Stanley Falkow

December 19, 1980

"Antibody Genes and Strategies for Their Expressions"
Leroy Hood

April 3, 1981

"Murine SLE: A Model for Autoimmunity"
Frank J. Dixon

December 3, 1981

"Gene Expression in Heterospecific Hosts: Strategies and Surprises"
Stanley N. Cohen

DeWitt Stetten, Jr. Lecture

The DeWitt Stetten, Jr. Lecture was established by the National Institute of General Medical Sciences in 1982 and is presented annually in honor of Dr. Stetten, third NIGMS Director and now Senior Scientific Advisor, NIH.

October 13, 1982

"A Molecular Analysis of Genes That Determine Developmental Pathways"
David S. Hogness

October 5, 1983

"Left-Handed Z-DNA and the Regulation of Transcription"
Alexander Rich

October 31, 1984

"Cellular Signaling: What Does the Structure of the Acetylcholine Receptor Tell Us About Its Function?"
Robert M. Stroud

The Marjorie Guthrie Lecture in Genetics

The annual Marjorie Guthrie Lecture in Genetics was established by the National Institute of Neurological and Communicative Disorders and Stroke and the National Institute of General Medical Sciences in 1983.

May 11, 1983

"Illumination of Disease Processes Through Molecular Genetics"
David Baltimore

April 19, 1984

"Molecular Approaches to the Characterization of Neuronal Function"
Floyd E. Bloom

April 2, 1985

"Recent Studies in Huntington's Disease"
Joseph B. Martin

The Seymour J. Kreshover Lecture

The National Institute of Dental Research Lecture series was established in 1983 to recognize outstanding scientific accomplishment in basic and clinical research and to honor distinguished scientists who have made important contributions in areas of dental research.

In 1984 the lecture series was named for former NIDR Director, Seymour J. Kreshover, D.D.S., M.D., Ph.D.

September 22, 1983

"The Promotion and Inhibition of Collagen-Breakdown in Synovial Tissue"
Dame Honor B. Fell

September 17, 1984

"Genetic Analysis of the Virulence of Streptococcus Mutans: Prospects for an Anticaries Vaccine"
Roy Curtiss III

Nobel Laureates

Laureate	Field	Year	Supporting Institute(s)
Robert B. Merrifield, U.S.A.	Chemistry	1984	NIADDK
Henry Taube, U.S.A	do	1983	NIGMS
Sune Bergstrom, Sweden (Shared with J. R. Vane, U.K. and B. Samuelsson, Sweden).	Physiology or medicine	1982	NHLBI, NLM, NICHD
John R. Vane, U.K. (shared with S. Bergstrom and B. Samuelsson, Sweden).	do	1982	DRG, NIGMS, NIMH
Aaron Klug, U.K.	Chemistry	1982	NIAID
Roald Hoffmann, U.S.A. (shared with K. Fukui, Japan)	do	1981	NIGMS
David H. Hubel, U.S.A. (shared with T. Wiesel and R. W. Sperry, U.S.A.)	Physiology or medicine	1981	NEI, NIGMS, NINCDS
Torsten Wiesel, U.S.A. (shared with D. H. Hubel and R. W. Sperry, U.S.A.).	do	1981	NEI, DRR, NINCDS
Paul Berg, U.S.A. (shared with W. Gilbert, U.S.A., and F. Sanger, U.K.)	Chemistry	1980	NIGMS, NCI
Walter Gilbert, U.S.A. (shared with P. Berg, U.S.A., and F. Sanger, U.K.)	do	1980	NIGMS, NIADDK
Baruj Benacerraf, U.S.A. (shared with G. Snell, U.S.A., and J. Dausset, France).	Physiology or medicine	1980	NIAID, NCI
George Snell, U.S.A. (shared with B. Benacerraf, U.S.A., and J. Dausset, France).	do	1980	NIAID, NCI
Jean Dausset, France (shared with B. Benacerraf and G. Snell, U.S.A.)	do	1980	NIAID, NCI
Herbert C. Brown, U.S.A. (shared with G. Wittig, W. Germany)	Chemistry	1979	NIGMS
Hamilton O. Smith, U.S.A. (shared with D. Nathans, U.S.A., and W. Arber, Switzerland).	Physiology or medicine	1978	NIGMS, NIAID
Daniel Nathans, U.S.A. (shared with H. O. Smith, U.S.A., and W. Arber, Switzerland).	do	1978	NIGMS, NCI
Roger C. Guillemin, U.S.A. (shared with A. V. Schally and R. Yalow, U.S.A.).	do	1977	NIADDK, NICHD, DRR
Andrew V. Schally, U.S.A. (shared with R. C. Guillemin and R. Yalow, U.S.A.).	do	1977	NIADDK, NICHD, NIGMS
D. Carleton Gajdusek,[1] U.S.A. (shared with B. S. Blumberg, U.S.A.)	do	1976	NINCDS
Baruch S. Blumberg, U.S.A. (shared with D. C. Gajdusek, U.S.A.)	do	1976	NHLBI, NCI
William N. Lipscomb, U.S.A.	Chemistry	1976	NIGMS, DRG
David Baltimore, U.S.A. (shared with R. Dulbecco and H. M. Temin, U.S.A.).	Physiology or medicine	1975	NIAID, NCI
Renato Dulbecco, U.S.A. (shared with D. Baltimore and H. M. Temin, U.S.A.).	do	1975	NIAID, NCI
Howard M. Temin, U.S.A. (shared with D. Baltimore and R. Dulbecco, U.S.A.).	do	1975	NCI
Albert Claude, Belgium (shared with C. de Duve, Belgium, and G. E. Palade, U.S.A.).	do	1974	NCI
Christian de Duve, Belgium (shared with A. Claude, Belgium, and G. E. Palade, U.S.A.).	do	1974	NICHD, NIGMS, NHLBI, NIA
George E. Palade, U.S.A. (shared with A. Claude and C. de Duve, Belgium).	do	1974	NHLBI, NIGMS
Gerald M. Edelman, U.S.A. (shared with R. R. Porter, U.K.)	do	1972	NIADDK, NIAID, NHLBI
Rodney R. Porter, U.K. (shared with G. M. Edelman, U.S.A.)	do	1972	NIAID
Christian B. Anfinsen,[1] U.S.A. (shared with S. Moore and W. H. Stein, U.S.A.).	Chemistry	1972	NHLBI, NIADDK
Stanford Moore, U.S.A. (shared with C. B. Anfinsen and W. H. Stein, U.S.A.).	do	1972	NIGMS, NINCDS
William H. Stein, U.S.A. (shared with C. B. Anfinsen and S. Moore, U.S.A.).	do	1972	NIGMS
Earl W. Sutherland, Jr., U.S.A.	Physiology or medicine	1971	NIGMS, NHLBI, NIADDK
Julius Axelrod,[1] U.S.A. (shared with B. Katz, U.K. and U. von Euler, Sweden).	do	1970	NHLBI, NIMH
Ulf von Euler, Sweden (shared with J. Axelrod, U.S.A., and B. Katz, U.K.)	do	1970	NINCDS
Luis Leloir, Argentina	Chemistry	1970	NIGMS, NIAID
Max Delbruck, U.S.A. (shared with A. D. Hershey and S. Luria, U.S.A.)	Physiology or medicine	1969	NIGMS
Alfred D. Hershey, U.S.A. (shared with M. Delbruck and S. Luria, U.S.A.)	do	1969	NIGMS, NCI, NICHD
Salvador Luria, U.S.A. (shared with M. Delbruck and A. D. Hershey, U.S.A.).	do	1969	NIAID, NIGMS, NCI
Robert W. Holley, U.S.A. (shared with H. G. Khorana and M. W. Nirenberg, U.S.A.).	do	1968	NIGMS, NCI
H. Gobind Khorana, U.S.A. (shared with R. W. Holley and M. W. Nirenberg, U.S.A.).	do	1968	NIGMS, NCI, NIAID
Marshall W. Nirenberg,[1] U.S.A. (shared with R. W. Holley and H. G. Khorana, U.S.A.).	do	1968	NHLBI
Lars Onsager, U.S.A	Chemistry	1968	NIGMS
Haldan K. Hartline, U.S.A. (shared with G. Wald, U.S.A., and R. Granit, Sweden).	Physiology or medicine	1967	NINCDS, NEI

See footnote at end of table.

Nobel Laureates—*Continued*

Laureate	Field	Year	Supporting Institute(s)
George Wald, U.S.A. (shared with H. K. Hartline, U.S.A., and R. Granit, Sweden).	....do	1967	NINCDS, NEI
Charles B. Huggins, U.S.A. (shared with F. P. Rous, U.S.A.)	Physiology or medicine	1966	NCI, DRG, NIADDK, NIGMS
Jacques L. Monod, France (shared with F. Jacob and A. Lwoff, France)	....do	1965	NIAID
Robert B. Woodward, U.S.A.	Chemistry	1965	NIGMS, NHLBI, DRG, NIADDK
Konrad Bloch, U.S.A. (shared with F. Lynen, Germany)	Physiology or medicine	1964	NIGMS, NHLBI, DRG
James D. Watson, U.S.A. (shared with F. H. C. Crick and M. H. F. Wilkins, U.K.).	....do	1962	NIGMS, NIADDK, NCI, DRR, NIAID
John C. Kendrew, U.K. (shared with J. F. Perutz, U.K.)	Chemistry	1962	NIADDK
Peter B. Medawar, U.K. (shared with F. M. Burnet, Australia)	Physiology or medicine	1960	NIAID
Arthur Kornberg, U.S.A. (shared with S. Ochoa, U.S.A.)	....do	1959	NIGMS, NIAID, NCI, NIADDK, NIA
Severo Ochoa, U.S.A. (shared with A. Kornberg, U.S.A.)	....do	1959	NIADDK, NIGMS, NCI, DRG
George W. Beadle, U.S.A. (shared with J. Lederberg and E. L. Tatum, U.S.A.).	....do	1958	NIGMS, NHLBI, DRG
Joshua Lederberg, U.S.A. (shared with G. W. Beadle and E. L. Tatum, U.S.A.).	....do	1958	NIGMS, NIAID, NINCDS, NICHD, DRR, NCI
Edward L. Tatum, U.S.A. (shared with G. W. Beadle and J. Lederberg, U.S.A.).	....do	1958	NIGMS, NCI,
Dickinson W. Richards, Jr., U.S.A., (shared with A. Cournand, U.S.A., and W. Forssmann, Germany).	....do	1956	NIADDK, NCI, NHLBI, NIGMS
Vincent du Vigneaud, U.S.A.	Chemistry	1955	NBHLI, NCI, NIGMS
Thomas H. Weller, U.S.A. (shared with J. F. Enders and F. C. Robbins, U.S.A.).	Physiology or medicine	1954	NIAID, NIGMS
Linus C. Pauling, U.S.A.	Chemistry	1954 1962	NIGMS, NHLBI, DRG, NIAID, NCI
Fritz A. Lipmann, U.S.A. (shared with H. A. Krebs, U.K.)	Physiology or medicine	1953	NIGMS, NCI
Philip S. Hench, U.S.A. (shared with E. C. Kendall, U.S.A., and T. Reichstein, Switzerland).	....do	1950	DRG
E. O. Lawrence, U.S.A.	Physics	1939	NCI

[1] Signifies NIH scientists.

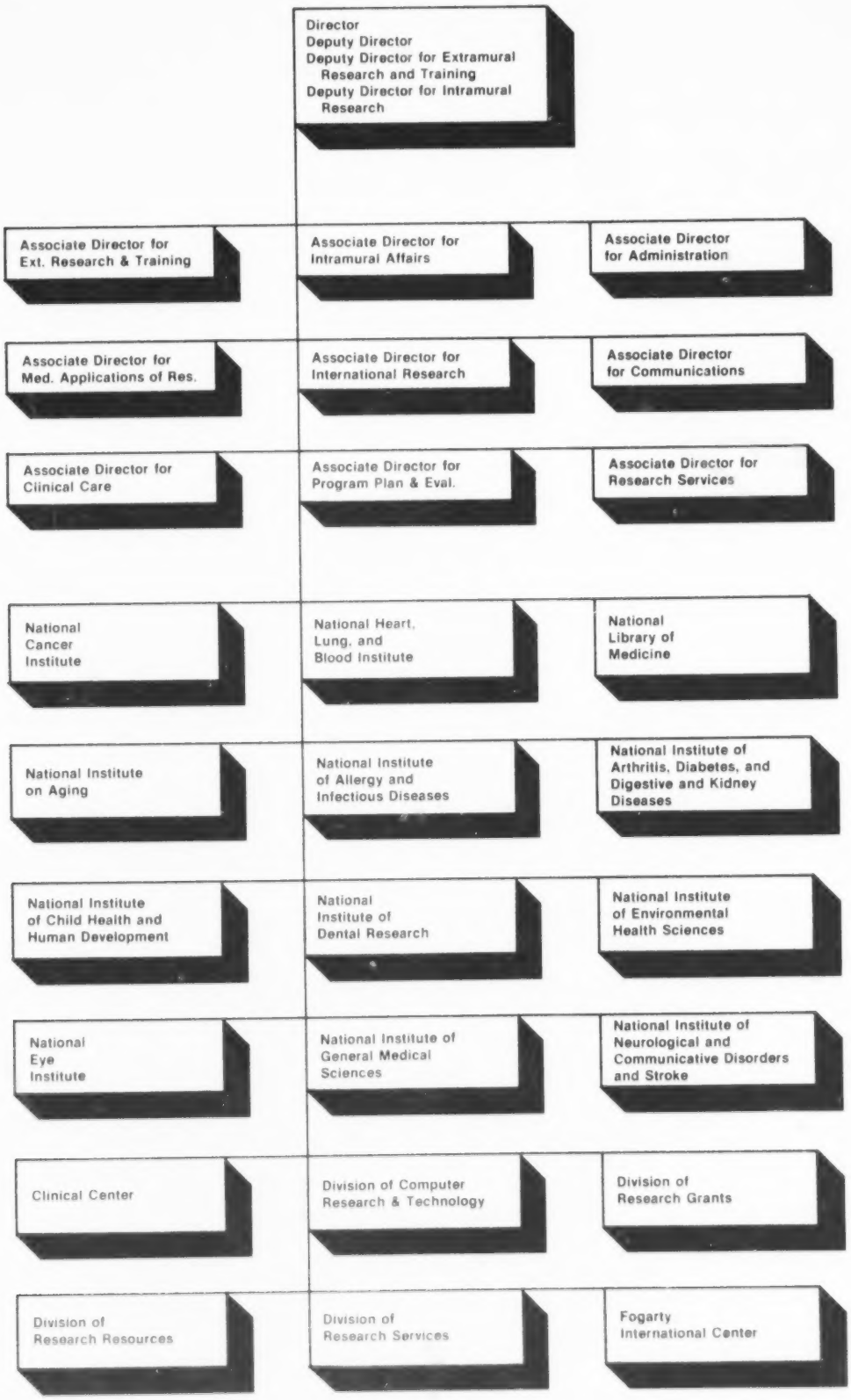
NIH Nobel Prize Winners

1968—Dr. Marshall W. Nirenberg, National Heart, Lung, and Blood Institute, shared the Nobel Prize in Physiology or Medicine for discovering the key to deciphering the genetic code. Dr. Nirenberg and two other researchers, working independently, with whom he shared the prize, made major advances in understanding the chemical mechanisms by which genetic language or information is translated into various proteins that determine the nature and characteristics of all living things. Dr. Nirenberg was the first NIH Nobelist and also the first Federal employee to receive a Nobel Prize.

1970—Dr. Julius Axelrod, National Institute of Mental Health, shared with two scientists from England and Sweden the Nobel Prize in Physiology or Medicine for their independent research into the chemistry of nerve transmission. The three were cited for their "discoveries concerning the humoral transmitters in the nerve terminals and the mechanisms for their storage, release and inactivation." Specifically, Dr. Axelrod found an enzyme that terminates the action of the nerve transmitter, noradrenaline. He also demonstrated that some antidepressant drugs act by preventing the re-uptake of noradrenaline and thus prolong its action in the brain.

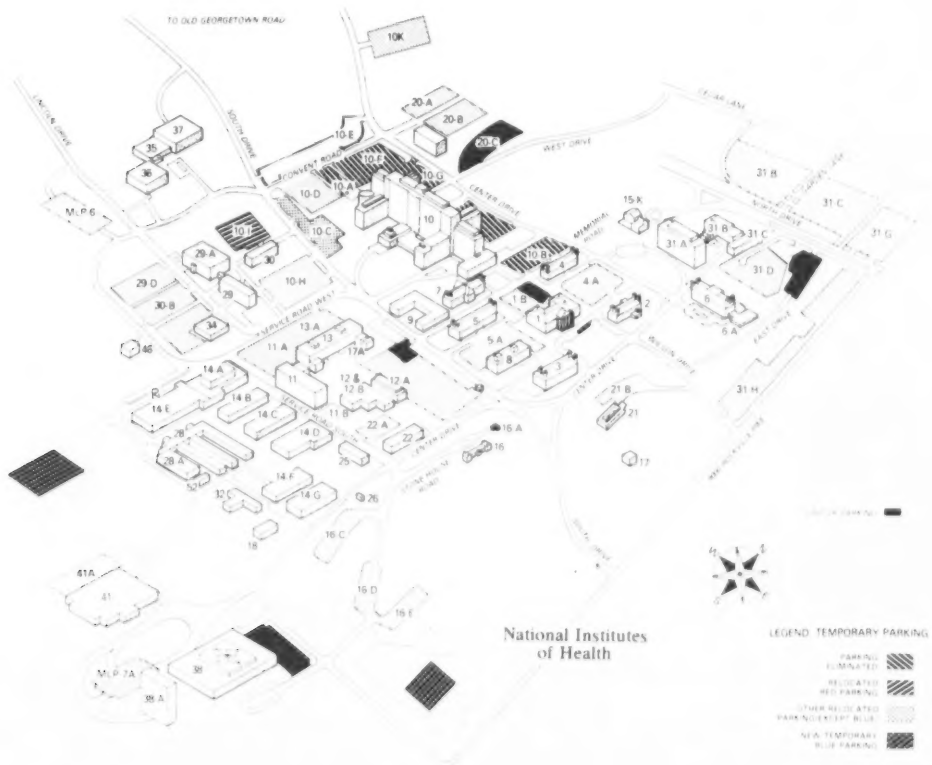
1972—Dr. Christian B. Anfinsen, National Institute of Arthritis, Metabolism, and Digestive Diseases, won the Nobel Prize in Chemistry for his work "on ribonuclease, especially concerning the connection between the amino acid sequence and the biologically active conformation." Dr. Anfinsen provided the first clue to the structure of ribonuclease by demonstrating that it is comprised of a single polypeptide chain. He and his colleagues at Rockefeller University (with whom he shared the prize) demonstrated that the information required to fold the polypeptide chain of ribonuclease into the specific three-dimensional form of the active enzyme resides in the sequence of amino acids. Therefore, it became clear that this protein could be synthesized in the laboratory by joining the proper amino acids in the correct order and then allowing the chain of amino acids to spontaneously fold. This led to the first synthesis of an enzyme from chemicals in the laboratory at Rockefeller University. Such studies are basic to an understanding of normal life processes as well as of inherited metabolic diseases.

1976—Dr. D. Carleton Gajdusek, National Institute of Neurological and Communicative Disorders and Stroke, shared the Nobel Prize in Physiology or Medicine with Dr. Baruch S. Blumberg, now of the Institute for Cancer Research in Philadelphia. They won the award for their discoveries concerning new mechanisms for the origin and dissemination of infectious diseases. Dr. Blumberg was at NIH (with the National Institute of Arthritis, and Metabolic Diseases) in the 1960's, and did part of his prizewinning research at NIH.


Director
Deputy Director
Deputy Director for Extramural Research and Training
Deputy Director for Intramural Research
Associate Director for Ext. Research & Training
Associate Director for Intramural Affairs
Associate Director for Administration
Associate Director for Med. Applications of Res.
Associate Director for International Research
Associate Director for Communications
Associate Director for Clinical Care
Associate Director for Program Plan & Eval.
Associate Director for Research Services
National Cancer Institute
National Heart, Lung, and Blood Institute
National Library of Medicine
National Institute on Aging
National Institute of Allergy and Infectious Diseases
National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases
National Institute of Child Health and Human Development
National Institute of Dental Research
National Institute of Environmental Health Sciences
National Eye Institute
National Institute of General Medical Sciences
National Institute of Neurological and Communicative Disorders and Stroke
Clinical Center
Division of Computer Research & Technology
Division of Research Grants
Division of Research Resources
Division of Research Services
Fogarty International Center

Buildings

1	Administration
2	National Institute of Arthritis, Diabetes, Digestive, & Kidney Diseases
3	National Heart, Lung, & Blood Institute
4	National Institute of Arthritis, Diabetes, Digestive, & Kidney Diseases
5	National Institute of Allergy & Infectious Diseases
6	National Institute of Child Health & Human Development; National Eye Institute; National Institute of Arthritis, Diabetes, Digestive, & Kidney Diseases
6A	National Institute of Child Health and Human Development and National Eye Institute
7	National Institute of Allergy & Infectious Diseases
8	National Cancer Institute; National Institute of Allergy & Infectious Diseases; National Institute of Neurological and Communicative Disorders and Stroke
9	National Institute of Mental Health; National Institute of Neurological and Communicative Disorders & Stroke; National Eye Institute
10	Clinical Center
10a	Surgical Wing
11	Boiler and Refrigeration Plan
11a	Incenerator Building
12	Division of Computer Research and Technology; Fire House; Garage
12A	Division of Research Services; Division of Computer Research and Technology; Office of Program Planning and Evaluation. Division of Engineering Services
12B	Division of Computer Research and Technology
13	Office of Materiel Management; Division of Engineering Services; Plant Engineering Branch; Laundry; Engineering Design Branch; Construction Engineering Branch; Division of Safety; Biomedical Engineering & Instrumentation Branch, DRS.
14A, B, C, D, E, F, G	Animal and Animal Feed Building, Veterinary Resources Br.
15K	Wilson House, National Institute of Mental Health
16	Fogarty International Center
16A	Fogarty International Center
17	Electrical Power Vault
17A	Electrical Power Vault
18	Physiology Section, NICHD
20	Apartment
21	Radiation Safety, DS; Radiopharmaceutical Section, Nuclear Med. Dept., CC
22	Grounds Maintenance Building; Transportation
25	Chemical Storage
26	Chemical Disposal
28	Experimental Surgery & Clinical Medicine Sec., VRB, DRS.
28A	Veterinary Resources Branch Comparative Pathology Section
29	Bureau of Biologics (FDA)
29A	Bureau of Biologics (FDA)
30	National Institute of Dental Research
31	General Office Building
32	Greenhouse; National Institute of Mental Health
34	Chilled Water Plant
35	Cafeteria
36	Natl. Inst. of Mental Health; Natl. Inst. of Neurological and Communicative Disorders and Stroke; Natl. Inst. of Child Health & Human Development; Natl. Heart, Lung, & Blood Inst.
37	National Cancer Institute
38	National Library of Medicine
38A	Lister Hill National Center
41	National Cancer Institute; Emergency Virus Isolation Facility
46	Electrical Power Vault
MLP6	Multi Level Parking 6.
MLP7A	Multi Level Parking



NIH Publication No. 85-5
September 1985